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# Commodore
## MAGAZINE




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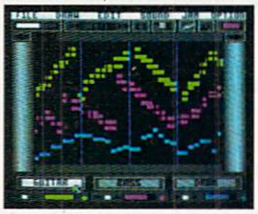
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# Commodore MAGAZINE

**DECEMBER 1987**, *Volume 8, Number 12*




84




65

## FEATURES



## COVER STORY



**COVER PHOTO:** *Chuck Bartholomew*
Computer Graphics: *Kara Blohm*

## DEPARTMENTS

## LETTERS



To the Editor:

While most are quite excellent in their topic, one must admit that at least *some* of the articles in your pages are, well, "esoteric." The piece "What Happened to the Computer Revolution?" by Dan Gutman (September *Commodore Magazine*), however, was *more* than just "computer-esoteric." That article has historical, sociological and philosophical value to such extent that I was able to get my *wife* to read it, as much of a computer-hater she has become over the years!

One point has me a bit confused. Gutman says that the "personal computer first hit the market in 1977." I *assume* he means the "all-in-one-piece" PET 2001/8K as "S-100" type computers were available several years before that and *some* of us would argue, clumsy as they might have been, those "earlier" machines should be called "personal computers."

I bought the first PET to hit Houston — serial number 000058! I am almost *certain* that purchase was made in late 1976. Some years ago, sadly, I decided to throw out all check stubs once three years old, so I was unable to find a *dated* document which would prove that. A year or so later the new "full-sized keyboard" PET 2001-16N showed up in an Ancrona store and I soon bought a (then) new 2001-16N, with a 2040 disk drive and a 2022 printer. I think that *newer* equipment was bought in '77, maybe early '78!

I might argue that there is one feature of the Commodore computer line which seems to have been dropped from new designs (although I think it is still present in the 64?). That is the "PUP" (Parallel User Port). Now I realize only a relatively small percentage of Commodore's customers can use the PUP, but those of us who *can* would be hard-pressed to try to interface the other "outputs" from the machines to do the same things! That is the PUP has special attributes which make it very nice for "hackers," as its 8 bits can be individually programmed to function as either inputs or outputs, even simultaneously. That makes it super for "hacker work."

*Sincerely,*
*Jan Rowland*
*Houston, TX*

*Editorial Response: Well, we dug back, and talked to some old customers, and it looks like you are correct. The first PETs were delivered at the end of 1976, not 1977 as we stated. Our compliments on your memory. You'll also be happy to know that although we've shortened the name to the User Port, the parallel user port or "PUP" is still on the Commodore 64C and the Commodore 128 and 128D. We agree that it is a hacker's delight, and in fact, we've been running a series of articles providing instruction and projects for use with the User port.*

To the Editor:

I just wanted to compliment you on the fine work that was put into the September 1987 issue. I thought that Dan Gutman's article on the Computer Revolution was excellent and found it fascinating as he compared it to other revolutions. As a devoted 64 owner, I also liked Gary Fields article about MicroProse, the king of simulation and found it fascinating as well. I never thought a software company put so much care into their products as described in the article, but I guess since MicroProse's software is excellent, such care is needed. Thanks again for the fine issue and keep up the good work.

*Sincerely,*
*Mitch Franchini*
*Harrisburg, PA*

To the Editor:

I think you should retract your statements concerning biorhythms and astrology programs in "Saturday Night Software" (July *Commodore Magazine*). I have contacted both Astrolabe and Zephyr Services to no avail.

*Sincerely,*
*Kirby Logan*
*Clinton, TN*

*Editorial Response: We apologize for the error. The programs mentioned from Astrolabe and Zephyr for biorythms and astrology are not available for Commodore computers. However,* Fun Biorhythms *is a 64 biorythms program available for $9.95 from Free Spirit Software, 538 S. Edgewood, LaGrange, IL 60525; (312)-352-7323. In addition, Matrix software carries a complete line of astrology programs for the Commodore 64, ranging in price from $30-500.* Astro*Talk *($39.95) is a good introductory package which provides complete "readings" as well as house positions and rising signs. For more information, contact Matrix Software, 315 Marion Ave., Big Rapids, MI 49307; (616)-796-2483.*


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*Commodore Magazine*, Volume 8, Number 12, December 1987.

*Commodore Magazine* is published monthly by Commodore Magazine Inc., 1200 Wilson Drive, West Chester, PA 19380. U.S.A. U.S. subscriber rate is $35.40 per year; Canadian subscriber rate is $45.40 per year; Overseas subscriber rate is $65.00 per year. Questions concerning subscription should be directed to Commodore Magazine Subscription Department, Box 651, Holmes, Pennsylvania 19043. Phone (800) 345-8112. In Pennsylvania (800) 662-2444.



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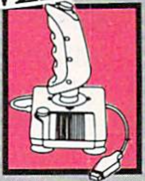
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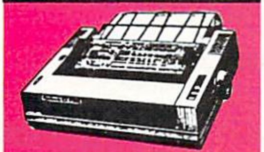
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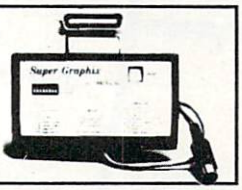
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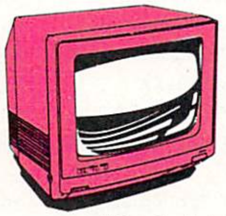
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# Hard Drives for the Amiga




Phoenix Electronics, Inc. is now shipping hard disk drives for the Amiga 500 and 1000. Both drive series are available in 20 and 40 megabyte versions. The PHD 500 is in a stand-alone, vented, all-metal chassis for the Amiga 500. It features a true SCSI interface, auto configuration compatibility and its own internal power supply. Retail price of the 20 Meg PHD 500/20 is $949.00. Suggested retail on the 40 Meg PHD 500/40 is $1399.00.

The PHD 1000 for the Amiga 1000 has true SCSI interface and auto configuration. The all-metal chassis is color coordinated with the Amiga and sits on top of the CPU. The internal power supply has extra capacity for RAM additions. The 20 Meg version has a suggested retail price of $969.00. The 40 Meg PHD 1000/40 retails for $1429.00.

For more information contact Phoenix Electronics, Inc., P.O. Box 156, Clay Center, KS 67432, or call (913)-632-2159.

# AmiEXPO Announced

AmiEXPO, The Amiga Event, is scheduled to be held in New York City on October 10-12, in Los Angeles on January 16-18, and in Chicago, July 22-24. AmiEXPO's primary focus is to meet the needs of the expanding Amiga community — users, developers and dealers by providing an opportunity to meet and evaluate new products.

AmiEXPO features three days of intensive sessions on everything from Desktop Video and Publishing to CD-I and Optical Media. In addition the exhibit hall will host the Amiga Art Gallery, a collection of material from different media developed by Amiga artists.

AmiEXPO is being sponsored by AMUse, the New York City Amiga User Group and expects to draw over 12,000 attendees and 300 exhibitors. For more information, call (800)-32-AMIGA; in NY state call (212)-867-4663.

# Nimbus Accounting System

Oxxi, Inc. has announced the availability of **Nimbus**, an easy-to-use yet powerful cash management accounting system for small businesses. **Nimbus** includes pre-defined reports designed to help the small business manager instantly know a customer's payment status, outstanding balances to vendors and his P/L statement.

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**Nimbus** retails for $149.50. For more information contact Oxxi, Inc., 1835-A Dawns Way, Fullerton, CA 92631, or call (714)-999-6710.

# Benchmark Modula-2

Oxxi recently entered the field of programmer productivity with the introduction of its new Modula-2 Software Construction Set called **Benchmark** for Amiga computers. **Benchmark** provides an environment for developing programs by integrating the primary tools used in software development: an Editor, Compiler and Linker.

Beginning programmers will find that **Benchmark** can be used right out of the box without performing any installation. Professional developers can distribute programs written in **Benchmark** without any further licensing requirements from Oxxi.

**Benchmark's** suggested retail price is $199.00. For more information contact Oxxi, Inc., 1835-A Dawns Way, Fullerton, CA 92631, or call (714)-999-6710.

# Micro-lawyer

Progressive Peripherals & Software has released **Microlawyer**, a disk library of over 100 common legal documents for personal, business and corporate use. **Microlawyer**, which is available for the Commodore Amiga and 64, is a do-it-yourself step-saver designed to be used in conjunction with legal advice. It enables anyone with a word processor to prepare legal documents such as power of attorney, pre-marital agreements, affidavits, leases, loan and mortgage forms, real estate contracts, wills, notary public forms, etc.

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## Dark Castle

Three-Sixty Inc., a newly-formed home software publisher, has released **Dark Castle** for the Amiga and Commodore 64. Set in medieval times, **Dark Castle's** hero must fight his way through fourteen different rooms of increasing difficulty to find and slay the notorious Black Knight. The game incorporates more than 70 digitized sound effects, including a hair-raising organ solo and the screams of the Black Knight's prisoners.

**Dark Castle** carries a suggested retail price of $39.95 for the Amiga version and $34.95 for the Commodore 64 version. For more information contact Three-Sixty Inc., 2105 S. Bascom Ave., Suite 290, Campbell, CA 95008, or call (408)-879-9144.

## Scholastic Catalog Available

Scholastic's **1987-88 Microcomputer Instructional Materials Catalog** is now available free to educators. The 96-page, full-color catalog features more than 300 products for classroom computer learning for grades K-12. All products featured in the catalog have been tested and recommended by teachers, students and educational experts across the country.

In addition, all products listed in this annual catalog are available for a 30-day preview. To receive a free catalog, teachers may write to Scholastic, Inc., Inquiry Department, P.O. Box 7502, 2931 East McCarty St., Jefferson City, MO 65102. Or call (800)-325-6149.

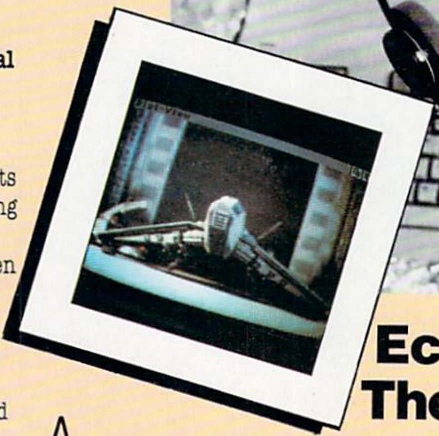


## Slide City

Slide City is offering its slide photography service to Amiga owners. Amiga artists can now get high quality 35mm slides of Amiga screens by sending their IFF format files on a 3.5-inch disk to Slide City. Slides are shot, processed and sent out by return mail, along with your disk within 24 hours.

Cost of the service is $3.00 per slide with a minimum order of two slides. This includes postage and handling (except for overnight delivery service). For more information, contact Slide City, 6474 Highway 11, Deleon Springs, FL 32028. Or call (904)-985-4594.



## Echelon and The Lip Stick

Access Software has announced the release of The Lip Stick, a voice activated control headset, designed to be used in conjunction with **Echelon** their 3D space flight simulator for the Commodore 64. **Echelon** is a top secret military facility where a few highly skilled pilots will be trained to operate the twenty-first century Lockheed C-104 Tomahawk. The Lip Stick controls various ship activities including the vehicle's numerous weapons systems. The unusual input device is a switched voltage positive feedback controlled amplifier built into a headset.

The Lip Stick is included in every **Echelon** package for the suggested retail price of $44.95. For more information contact Access Software, Inc., #A 2561 South 1560 West, Woods Cross, UT 84087. Or call (801)-298-9077.

## Investment Simulation

Pyxis Software introduces **Investment Simulation**, a general purpose investment analysis program for the Commodore 64 and 128. The program computes internal rate-of-return, equity rate-of-return, present net worth, life-cycle costs and capitalized present value. Focus is on limited equity investments and leveraging.

64 and 128 versions are both included on same disk. Retail price is $36.00. For more information contact Pyxis Software, P.O. Box 18016, Colorado Springs, CO 80935.

## Delta Patrol and Sanxion

Electronic Arts has announced two new additions to its Amazing Software line of action-oriented entertainment software. **Delta Patrol** and **Sanxion** are both high-speed, three-dimensional space adventures for the Commodore 64.

As a member of the elite police squadron, **Delta Patrol**, your battlecruiser takes you to the Delta Sector, a junk yard of lost ships, alien bandits and unknown forces of destruction.

In **Sanxion**, you and your high-speed attack craft are the lone defenders of a world under siege. Alien droves are attacking the cities of your planet, and your ability to align your ship's superior firepower with enemy targets is all that you have to defend yourself.

Each title carries a suggested retail price of $19.95. For more information, contact Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404. Or call (415)-571-7171.

# NBA FRANCHISES AVAILABLE: RATES REASONABLE!

(REQUIREMENTS: Knowledge of professional basketball. Capable of dealing with giants. Ability to handle high-pressure situations. Must bring own temper.)

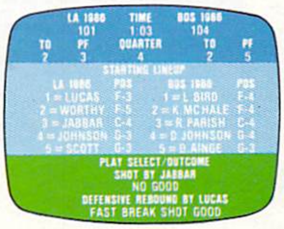
### Can YOU do the job?

Find out if you have what it takes in **NBA,** the animated stat-based basketball game. Take control of Larry Bird, Dominique Wilkins, Michael Jordon, Kareem Abdul-Jabbar and Bob Cousey. Pick the starting line-ups, send in substitutes and call for the fast break and full-court press. **NBA** takes into account everything that occurs on court. On offense, you call the play. Choose the sequence of passes, but be careful: it increases the chance of two points, but also can lead to a steal or blocked shot. Work the outside, or just go for the three-pointer. On defense, set up outside or close to the basket, go for the rebound, or turn on the pressure and try for a steal. A good NBA coach has to work the bench as well as the floor. Each player's stamina is rated by the number of minutes he can play. Use up your starter too early in the game, and you'll have to send in a sub during those final crucial minutes, and that could turn an overwhelming victory into a closely-contested defeat.

### From the designers of Super Sunday, NBA is the first and only fully-animated statistically-accurate basketball game on the market, coming in like a fast break with the following features:

- **A STAT-KEEPER PROGRAM** that allows you to keep track of how well your team is doing. This valuable accessory lets you save stats from the **NBA** game for later review. Individual players' performances and statistics are updated throughout the game. You can view them during and after the game on your screen or printer.
- **20 GREAT TEAMS** from the 1959-60 Boston Celtics to the four top teams from the 1985-86 season: Boston, Milwaukee, Houston and Los Angeles! In between are some of the greatest teams that ever played the game: the 1966-67 Philadelphia 76ers with Wilt Chamberlain and the classic match-up from the 1969-70 season between the Lakers and the New York Knicks!
- **YOUR BRILLIANT PLAY** re-enacted by all 10 players on screen.
- **THREE MODES OF PLAY:** head-to-head, solitaire and autoplay. The autoplay function also allows you to play the same teams several games in a row . . . a needed option to replay a season.





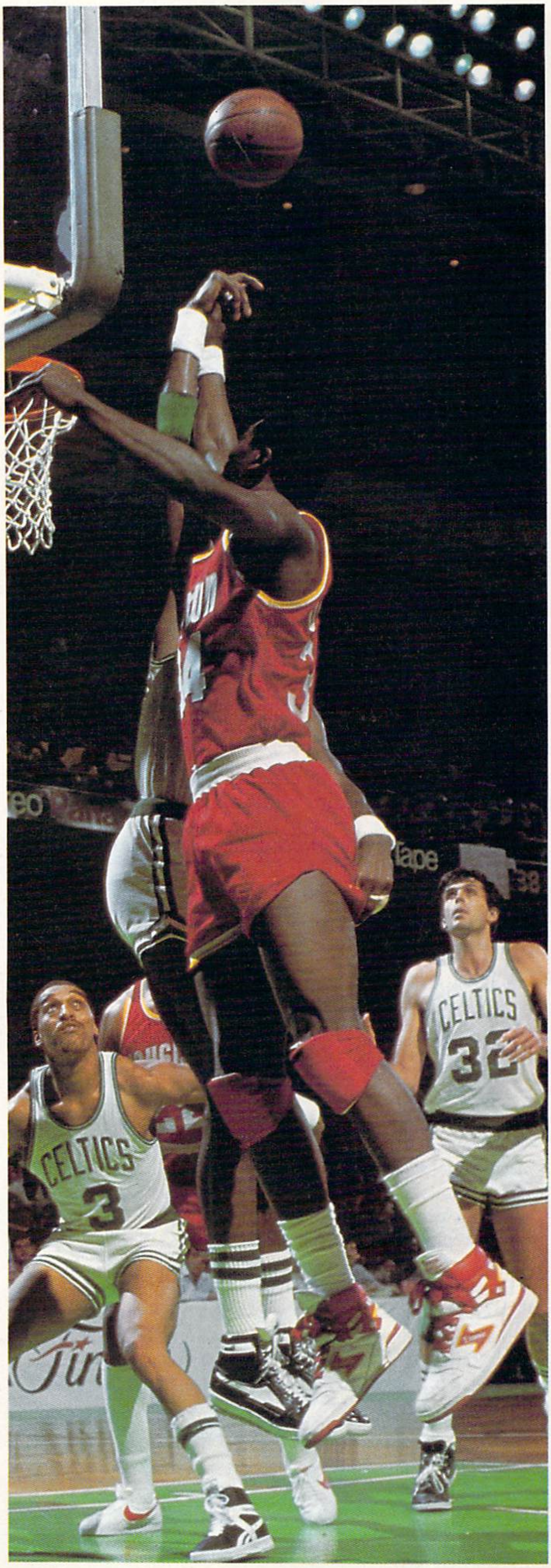

**NBA** can be played on the Apple® II family, Commodore® 64/128 or IBM® PC computers.
Price: $39.95.
Watch for the release of Accessory disks; **1987 Season** and **GM Disk.**

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# Flexidraw Version 5.5

Inkwell Systems has announced the availability of **Flexidraw** Version 5.5 for the Commodore 64 family of computers. Unlike the previously released versions, the revised edition includes data entry device support for Koala Technology's Touch Pad, Commodore-compatible joysticks, the Commodore mouse and Inkwell Systems light pens (now sold separately).

**Flexidraw** still includes automatic geometric shapes and line widths; copy, paste and edit modes; an "Oops" feature; hundreds of fill patterns, and other features from previous releases.

Inkwell has also released two new light pens: the model 170-C, an upgrade of the model formerly packaged with **Flexidraw** and the new 184-C tri-lobular, two-button touch surface light pen.

Suggested retail price for **Flexidraw** is $34.95. The 170-C light pen retails for $99.95 and the 184-C light pen for $59.95. For more information, contact Inkwell Systems, 5710 Ruffin Rd., San Diego, CA 92138, or call (619)-268-8792.

# Alien Fires—2199 A.D.

Paragon Software has introduced **Alien Fires—2199 A.D.** for the Amiga. **Alien Fires** is a futuristic science-fiction role playing game in which the player assumes the role of a Time Lord, a mythical traveler who transcends the barriers of time. The program includes a professionally composed and digitized rock soundtrack, smooth-scrolling 3D graphics, sophisticated character interaction and speech synthesis.

**Alien Fires—2199 A.D.** retails for $39.95. For more information, contact Paragon Software Corp., Plymouth Center, 521 Plymouth St., Greensburg, PA 15601 or call (412)-838-1166.

# Wordmaze

Mindscape's Educational Division has released **Wordmaze** for the Commodore 64. **Wordmaze**, a word puzzle program for students from grades three through twelve, helps students develop vocabulary and spelling skills as they search for words hidden in a block of scrambled letters. The program comes with eight word lists covering topics like sports or outer space.

**Wordmaze** is available for $49.95 and includes a teacher's guide and activity sheets. For more information, contact Mindscape, Inc., 3444 Dundee Rd., Northbrook, IL 60062. Or call (312)-480-7667.




# First Alert

First Alert has introduced a line of compact halon fire extinguishers ideal for home protection. These halon extinguishers leave no residue, therefore they will not damage sensitive electronic and computer equipment. In addition, since they're about the size of an average flashlight, they'll fit conveniently in a small desk drawer or cabinet.

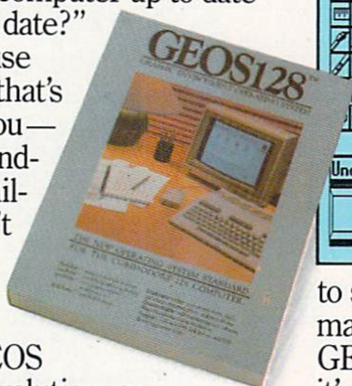
Available nationally at hardware stores, home centers, and catalog showrooms, the First Alert Halon Fire Extinguishers range in price from $22.99 to $39.95. For more information, contact First Alert, 780 McClure Rd., Aurora, IL 60504-2495, or call (312)-851-7330.



# IS YOUR 128
# OR GROW

So there you are, furiously working away at your Commodore 128, thinking everything is just peachy, when all of a sudden, it hits you. That haunting, hollow, horrible question that every computer owner must inevitably face:

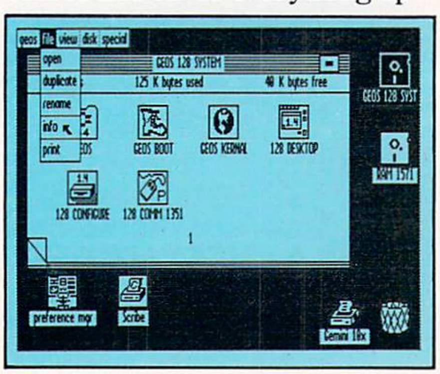
"Is my computer up to date—or out of date?"

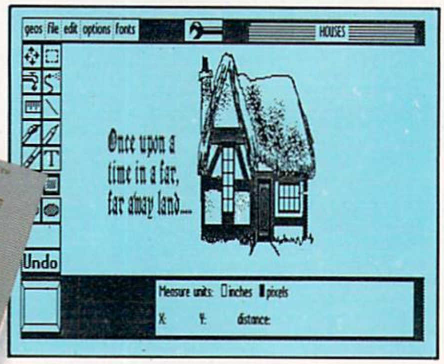



If you use GEOS 128, that's a question you—or your grandchildren's children—won't ever have to worry about. Because GEOS 128 is the revolutionary software system designed to push your hardware to new limits. Unleash its full power across a full 80 column screen. And expand its capabilities for years to come.

**We should have installed disk brakes.**

Loading up with GEOS turns your 128 into a mouse-driven maniac that loads, processes and saves everything up




to seven times faster than normal. Part of that's due to the GEOS diskTurbo, but most of it's due to the fact that GEOS 128 doesn't treat your 128 like a C64.

You see, by recognizing your machine as a 128, GEOS 128 operates at a full 2 MHz, instead of 1 MHz. So you get twice the speed. Twice the power. And since GEOS 128 also supports the quicker 1571 and 1581 double-sided disk drives—and the 1750 RAM expansion unit—there's no telling how much faster that puppy will fly.

**Fast and slick with mouse or stick.**

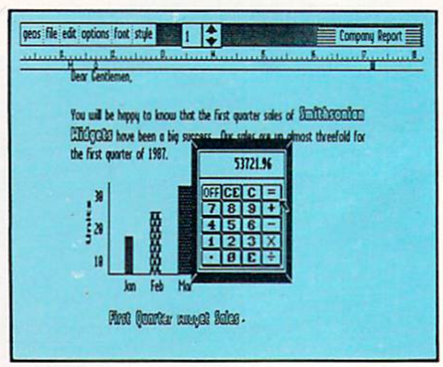
Using GEOS is ridiculously simple. All you need is a mouse or joystick, and a keen ability to point and click. Everything else is pretty much a matter of reading *menus* (a technical term for "little lists of things"), or selecting *icons* (a technical term for "little pictures of things"). It's sort of like talking in sign language.

For example, if you want a document for word-processing, you point to the icon that looks like a stack of papers. Click your mouse and bingo—you're in the file. If you want to erase the file, you drag the stack of papers over to the little waste basket and click your mouse.

Poof. That's about as tough as it gets.

**Working within the system.**

Learning where things are in GEOS is pretty simple, especially if you've ever sat behind a desk. Because that's exactly how we designed




GEOS 128.

You keep your documents and graphics in files; everything else stays right on the desktop: the notepad, the calculator—there's even an alarm clock. In fact, the only thing our desktop

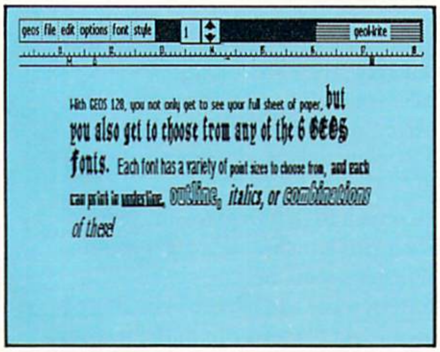
# GROWING UP ING OLD?

doesn't have is a place to put your feet when the boss isn't around.

But not only does GEOS give you a place to write and draw, it actually helps you write and draw better. Because unlike your basic office model, our desktop comes with geoWrite and geoPaint built right in.

With geoWrite, your way with words leaves people speechless, as they watch you effortlessly cut, paste and move entire blocks of copy anywhere on the page. And since geoWrite comes with different fonts in a variety of styles and sizes, your documents become even more dazzling.

With geoPaint, you can draw designs. Create with colors. And tantalize your tastes with tons of tones and textures. Invert, rotate or mirror images.




Then place them wherever you want: either in your geoWrite document, or in your GEOS Photo Album for later use.

But no matter what kind of masterpiece you create, you always get to view it on a beautiful, 80 column-wide screen. No more scrolling left to right. With GEOS 128, what you see really is what you get.




**The more you put into your system, the more you get out of it.**

Of course, when we say that GEOS 128 has far-reaching implications, we're not kidding around. Every GEOS 128 package includes free QuantumLink software, which hooks you (via modem) into a nationwide network of Commodore people just like you. There's even a service that will Laserprint your documents for you.

Now, we realize that's a lot to pack into one GEOS package. But as long as we're packing it in, we might as well let you know something else: There's more.

**The older it gets the better it looks.**

It's true. Because there are always new GEOS applications just waiting to jump off the shelves and into your 128. Packages like geoDex and geoFile, for keeping addresses and data straight. Fontpack and geoWrite Workshop, for tweaking text with that special, extra touch. And, of course, geoCalc, a full-featured graphics spreadsheet for all you number freaks.

They're just the first in a long line of GEOS applications that are constantly being developed to keep your 128 up to date.

So if you'd rather have your 128 grow up than grow old, load up with GEOS. You owe it to yourself. You owe it to your 128.

Heck, you owe it to your grandchildren.

*To order call 1-800-443-0100 ext. 234*

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**GEOS 128**




Berkeley Softworks

The brightest minds are working at Berkeley.

Compiled by Louis F. Sander

# Lou Sander's Tips & Tricks

*This month we feature 64 and 128 tips for getting the most out of your video monitor, plus our usual assortment of highly interesting goodies. You can be famous around the world if one of your own goodies gets published in this column. You'll even get paid for your idea. Send your candidates to:*

*Louis F. Sander*
*P.O. Box 101011*
*Pittsburgh, PA 15237*

**64 Border Fireworks:** This program puts a distinctive sparkling pattern into the 64's normally uninteresting screen border. As soon as the user presses a key, the border returns to its previous color. I use the routine, along with an on-screen message, to let the user know that the computer is waiting for some action from him.

To prepare the fireworks, include the accompanying lines somewhere at the start of your program. After they've been executed, a SYS679 will set the fireworks off from any part of the program, as many times as you'd like.

*Tom Morrow*
*Oak Park, Illinois*

```
10 REM 64 BORDER FIREWORKS - TOM
   MORROW
20 DATA 172,032,208,202,142,032,208,
   165
30 DATA 198,240,248,140,032,208,096
40 FOR J=679 TO 693:READ K:POKE J,K
   :NEXT
50 REM SYS679 STARTS, KEYPRESS STOPS
```

**128 auto-centering:** This interesting text-centering technique for the 128 uses a built-in but mostly forgotten feature of BASIC 7.0: the PRINT USING statement. Line 20 determines the character width of the current window and builds string CN$ to equal that width. The leading equal sign tells BASIC to center the information on the line.

When you want to center text in the window, just use
PRINT USING CN$;"text"
where "text" is whatever you want to center, expressed literally or as a string variable.

More than one text line can be centered with the same command by separating the text lines with commas, as shown in line 160. If you change window width, repeat line 20. If you do this often, you may want to put line 20 in a subroutine.

*Joseph P. Gill*
*Address Unknown*

```
10 REM 128 AUTO-CENTER - JOSEPH P.
   GILL
20 CN$="=":FOR J=1 TO RWINDOW(1)
   :CN$=CN$+"#":NEXT
100 :
110 PRINT"[CLEAR,DOWN]AUTO-CENTER
    DEMONSTRATIONS:[DOWN2]"
120 PRINT USING CN$;"THIS IS EASILY
    CENTERED!!"
130 PRINT
140 PRINT USING CN$;"SO IS THIS:"
150 PRINT
160 PRINT USING CN$;"A","MAN","THREW",
    "BASEBALLS","WHILE","I","WATCHED"
```

**Tips for better video:** Even if you have a top-quality monitor, your video picture can leave something to be desired. If you use a television set, the situation is likely to be worse. Here's a collection of proven ideas for enhancing the picture on all sorts of video displays.

- If you're looking at text, try turning down the color control on your display. The resulting black and white picture is often easier on the eyes.
- Adjust your monitor controls for non-text applications too — you'll be surprised how effective they are.
- Try using a different color combination on the screen. You can get a black screen by executing POKE 53280,0 : POKE 53281,0. Hold down the CTRL key and simultaneously press 2 to get nice white characters.
- Use a commercial glare screen to reduce glare, or wear polarized sunglasses to achieve a similar effect. (Properly selected, the shades can also make a fashion statement.)
- Wavy lines and other interference can often be eliminated by moving the computer's power supply as far from the monitor

*Continued on pg. 114*



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# AMIGA Tips & Tricks

Compiled by Tim Jones

*Welcome to Amiga Tips & Tricks. Each month we will offer a series of tidbits, teasers and short programming examples concerning using and programming the Amiga. If you have an item that you would like to submit for use, you can send it to:*

*Commodore Amiga Tips*
*651 Outrigger Dr.*
*Deltona, FL 32738*

*Items should be to the point, but describe your point completely. We welcome game tips and program usage tips as well as the type of items in this installment. If we use your hint, tip or program example, we will pay between $10 and $50.*

## Filenote Problems

If you have associated a filenote with a particular file, and then copy a new file into the old one, the old filenote will remain. For example, if you have a file called "MyFile" with an associated filenote of "My File Version 1.0," and then you create a version 2.0 of the file (assuming an editor where the new file will overwrite the old one), the new file will be there, but the old filenote will remain. To correct this, you must either change the name of your new file before saving it, or issue the command FILENOTE MyFile "" (note nothing between the double quotes).

*Roy Wagner*
*Westminster, CA*

## Interlace Jitter Reduction

I use the *Prowrite* word processor for my word processing purposes. Since *Prowrite* operates in the Interlaced mode, the publishers suggest that you purchase an item called "Jitter-Rid" to reduce the flicker caused by the interlaced screen display. I have found this to only be about 80% effective. They also suggest that you try adjusting your brightness and contrast way up. This will eventually wear out the phosphor coating of your monitor and you'll soon be replacing the monitor. As an effective (and less costly) alternative to burning up your monitor, I suggest that you try an architect's (or other directable lamp) aimed at your screen from one side so as not to introduce direct glare. This will not only help reduce the flicker even more, but it also helps prolong the life of your monitor.

*George R. Burnet*
*Palm Bay, FL*

*[This works somewhat with just a plain (no "Jitter-Rid") interlaced picture. - TAJ]*

## A1000 Keyboard and Mouse Extensions

Would you like to type on your Amiga 1000 keyboard more comfortably by placing it in your lap? Here's a simple and inexpensive solution. You can replace your regular keyboard cable with a modular handset cable (like Radio Shack Part# 279-306). Also, you can extend the cable on your mouse with a joystick extension cord (like Radio Shack Part# 276-1987). These will allow you to work (and PLAY) hard from the comfort of your favorite easy chair.

*Larry Hsieh*
*Kokomo, IN*

*[Thanks for including the RS Catalog numbers - TAJ]*

## Borderless AmigaBASIC Windows

Here are a couple of methods for creating borderless windows while using AmigaBASIC. The first is simply a coverup, and you are still stuck with a 78-column screen. The second actually changes the IDCMP structure for the window being affected.

```
PALETTE 0,0,0,0 'Black Background
PALETTE 1,0,0,0 'Black pen 1
WINDOW 2,"",(0,0)-(631,186),0,-1
COLOR 2
```

This just hides the border by making it the same color as the background. That's why you make the background and pen 1 colors the same and then use color 2 or 3 (on a default 2 plane screen) for your text.

If you want to actually force the window structure of your window into a true *borderless* situation, you can try the following:

```
x=WINDOW(7)+4
y=PEEK(x+22)
IF y AND 8 THEN
  y=y-8
ELSE
  y=y OR 8
END IF
POKE x+22,y
```

Use the front/back, drag or resize gadgets to refresh the display and see the results of this command. Remember that, if the resize gadget is attached, you will still only have 78 columns of text available. Even without the resize gadget, due to the GIMMEZEROZERO status of the default BASIC window, you will still see only 79 columns max using the standard font. Keep in mind that you are writing *directly* to the window structure in memory, so be careful when trying this with other items in the window's structure.

*Jerry Stillson*
*Scituate, MA*

*[GIMMEZEROZERO tells the Amiga display routines that your window is actually the area within the normally recognized borders of the window. This area usually begins one pixel below the title bar and one pixel to the right of the left border and continues to one pixel above the current bottom border and one pixel to the left of the resize gadget (if used) or right border. - TAJ]*

Continued on pg. 92



Adventure Gamers Applaud *Pirates!*
"Excellent… enormously good fun"
"Magnificent game"
"Exceeded my wildest expectations"
"You've done it again"
"PIRATES! *is excellent…a great swashbuckling game,* enormously good fun…*it should keep you playing for months.*" (Popular Computing Weekly, U.K.)
"*…your game has* exceeded my wildest expectations…*I have run up more game time on the computer in 3 days than in the entire month previous.*" (C.J.M., Buffalo, N.Y.)
"*This is one of the most* magnificent games *I have ever had the pleasure of playing! It has exactly the balance of realism, playability and silliness that I most adore.*" (J.P.S., San Diego, CA)
"PIRATES! *is a big hit in the Dallas area. This game is one of your best efforts. The graphics on all screens are excellent!* You have done it again, *Microprose.*" (Larry Medlin, DallasGamers, in Game News)
PIRATES! It's another winner from Sid Meier, author and designer of the award-winning F-15 STRIKE EAGLE and SILENT SERVICE. His creative genius has combined the best of simulation, role-playing and strategy games in this high seas adventure.
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- **Screen Print**

Other features include:

- **SwiftDos:** Allows you to access Commodore disk drive commands any time.
- **SwiftLock:** Enter your secret code before you leave your computer. The keyboard will be locked until you re-enter the code.
- **Extended Printer Control:** Enables you to send commands directly to your printer at any time.
- **SwiftLoad:** Allows your Commodore 1541 disk drive to load as fast as the 1571 disk drive.

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- **Quick Access to important information:** Retrieves and prints items by name, date range, index code—or any category stored in the system.
- **Calculates numerical data from column to column and field to field:** Allows you to perform spreadsheet tasks such as payroll calculations, cost estimates.
- **Compatible with GEOS**

*Reg. trademarks of Commodore Electronics, Ltd., Berkeley Software, Inc., Timeworks, Inc.

Reviewed by John Jermaine

# Gunship

**Computer:** Commodore 64
**Publisher:** MicroProse
180 Lakefront Drive
Hunt Valley, MD 21030
**Medium:** Disk
**Price:** $34.95

The AH-64 Apache Gunship Helicopter was designed to support military ground operations, while possessing the fire power to eliminate front-line enemy armored vehicles and sophisticated anti-aircraft weapons. The Gunship carries state-of-the-art toys of destruction: AGM-114A Hell-fire Anti-Tank Missiles, Folding Fin Aerial Rockets (FFARs) and the 30mm Chain Gun. With all of these options, the Apache Helicopter has emerged as one of the most versatile airborne weapons in the American arsenal, and you are the pilot of this flying tank in MicroProse's *Gunship* simulation.

At the outset *Gunship* offers a series of screens which provide information (vehicle identification practice, previous flight information, pilot roster, assignment briefing, intelligence information) and a chance to change the existing parameters of the game (duty assignment, style of flying, flight conditions).

Next, you must arm the *Gunship* with the appropriate weapons. The screen displays a simple diagram of the Apache Helicopter. To the right of the diagram is a group of symbols representing different weapons. To load weapons, move the glowing arrow to the weapon of your choice, press the fire button, carry that icon to the proper position on the helicopter, press the button again, and the weapons have been installed. Remember you will always be loading or unloading pairs of missiles. This must be done to balance the weight of the material on your helicopter. Try to estimate what you really need for the mission, load your requirements on the copter, and if you have room for additional weapons, add them to the inventory (bearing in mind they can affect the performance of the craft in certain scenarios). It pays to keep an eye on the current weight status of your Apache Gunship, even though the program won't allow you to overload the helicopter.

In terms of graphics, *Gunship* excellently blends realistic drawings, like those found in the cockpit, and an interesting

Once you experience these scenarios, you begin to think like a pilot and not like another arcade game player.




collection of vector pictures (vehicles in the field, the structure of hills, etc.) seen through the glass of your windshield. All the gauges, indicators, and flight-oriented controls seem to respond correctly to inputs made by the pilot. The sector map used during the game is bright, attractive, and displays important features like roads, streams, cultivated fields, bunkers, armored vehicles, etc. These drawings are some of the best 3D vector graphic displays I have seen to date in microcomputer games.

The sounds of the simulation were well done and support the graphics effectively. Most of these noises consist of the woosh of missiles being fired, the explosion of these projectiles hitting their targets, the sound of the blades turning and the several variations of that sound.

The Operations Manual is one of the most thorough software manuals I have ever seen. Every common situation a pilot might encounter is explained in simple everyday language. I also like the Apache Gunship specifications, and the MicroProse explanation of how a helicopter works is quite accurate. The manual is accompanied by a keyboard overlay which greatly simplifies operational and weapons selection control.

MicroProse's *Gunship* simulation is one of the most exciting microcomputer programs on the market today. It provides a realistic military combat situation, and it makes me feel like a pilot, and not just a user who can manipulate a joystick. I recommend this program to adventurous individuals 12 years and older.

To acquire a useful set of tips for this above average flight simulation, I consulted Randy Havener, a pilot and 64 user friend of mine who has played *Gunship* consistently for a month or so. These are his comments on key issues of the program:

Before you attempt to load the *Gunship* diskette, remove any fast loading mechanisms from the computer and disconnect the serial bus after the first drive. This procedure eliminates certain factors from the system which tend to cause problems when the program is in use.

1. **Air Temperature** — As the temperature and humidity go up, the air becomes thinner, and your helicopter won't fly as well. You may also experience new limitations concerning how much weight your craft can carry on a mission. A wise pilot will be concerned with this factor, especially in Southeast Asia, the Middle East, or Central America. If you happen to experience lift problems during a mission that cannot be attributed to enemy fire striking your gunship, consider trying to correct the situation by jettisoning a weapon's pod. The loss of weight may allow you to return to base or continue the mission.

2. **Arming The Helicopter** — Study the intelligence report of the area you will be flying in, consider the types of weapons that are common in that region, and think about the nature of your assignment before you load anything on the Apache Gunship.

3. **Flying The Apache Gunship** — Try more difficult assignments as soon as you become familiar with the controls of the gunship. This approach will put you into combat situations where you must make snap decisions or get shot down. Once you experience some of these scenarios, you really begin to think like a pilot and not like another arcade game player. Gauges

*Continued on pg. 124*


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Reviewed by Gary V. Fields

# The Talking Coloring Book

**Computer:** Amiga
**Publisher:** JMH Software Of Minnesota
7200 Hemlock Lane
Maple Grove, MN 55369
**Medium:** Disk
**Price:** $29.95

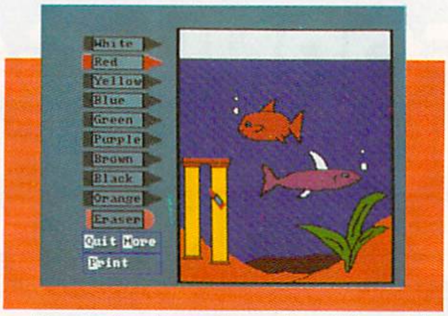
When I first read the specifications for the Amiga, the possibilities for its built-in speech synthesizer charged my imagination. At last software developers are beginning to utilize this powerful feature — *The Talking Coloring Book* is one of the first. Marketed as a combination educational/fun package, it lets even the youngest child use the Amiga's mouse to draw and color pictures while learning colors.

The title screen displays a colorful clown while the Amiga's male voice introduces the product. Next it speaks and highlights the screen listing the four options: Demonstration, Practice, Color and Draw.

Selecting Demonstration summons a screen showing nine crayons with a label on each. The color of each is spoken as the crayons change color. After the demo finishes, the child can use the mouse to select a crayon, after which the color will again be spoken. Using this point-and-hear method the child will associate the word for the color with the actual color.

The Practice option works like a simple quiz. Again nine labeled (uniformly grey in color) crayons are displayed, but this time the voice of the computer asks the child to point to a particular color word. No score of proper or improper responses is tallied and no time limits are enforced. The idea is simple — help the child learn to associate groups of letters (words) with their corresponding color.

If the Color option is selected the names of the ten pictures which come with the program are listed on the screen. To select a picture the child simply points and clicks the mouse. The picture, bordered by nine labeled crayons and an eraser appears. After a crayon has been picked the program will speak the color and the child can point at a spot in the picture and fill it with that color by simply clicking the mouse. To change colors the child can either erase (same as coloring except color is




subtracted) or just color on top of the existing shade using another crayon. Finished pictures can be dumped to a color printer for hard copy.

The Draw option opens up a clear screen page for the child to draw on, erase, and revise whatever creation his/her mind and wrist motion can conjure (no coloring is possible during this operation). Finished artwork can be saved to disk and then selected for coloring.

While drawing, the child needs to be careful to close forms or else color will bleed through to adjacent areas when a color is applied. There is no real damage done by such a mistake, but to correct the problem (connect the lines) the child must abandon the coloring screen and reload the uncolored page and finish the lines. My five year old was able to accomplish the functions unaided. I suspect even younger children could do as much — the mouse activated input makes it that easy. The drawing screen offers nothing fancy; just draw or erase.

While this software will not replace plain paper and crayons it *can* complement them. Because the child can quickly and easily correct errors and produce more "professional looking" results, the timid or reserved ones may be more inclined to experiment using the program than they would be with a less forgiving medium. Beyond teaching children to read and recognize some words and express themselves graphically, the program also exposes them to computers. It is good for young children to see the computer as a useful tool which they can control — *The Talking Coloring Book* does that.

There are some things about the *Coloring Book* which I didn't like. First, colored pictures cannot be saved to disk for future viewing. Their uncolored creations can be stored and enjoyed over and over, but not the finished colored ones. Without a printer, the colored pictures disappear forever when the computer is turned off.

Another problem I encountered concerned the manual — there is none. That's really no problem 98% of the time. But if you are like me and do not have a color printer and your child wants to dump his/her drawing to your black and white dot-matrix printer, you may find yourself in trouble. The inclusion of a simple manual with instructions on how to properly select the printer would eliminate a lot of frustration for those new to the Amiga. Everyone dislikes reading manuals, but needing one and not having one is even worse.

The inclusion of speech makes the *Coloring Book* a much more appealing and helpful product than it would be without the voice. But oddly enough, the version used for this review mixed speech with silence. The coloring and demo screens used the built-in voice perfectly, but when the child moves to the drawing screen the program goes mute. For example, when the child picks a crayon in the Coloring screen, the program says the word (red, green, eraser, etc.), but when the child picks a tool in the Drawing screen the program says nothing. The screen which really needs speech but does not have it is the "Pick A Picture To Color" display. The program reads the available files from the disk and the child can choose which one to color or change (edit) by pointing to it. I expected the voice to say the filenames as they were highlighted but it did not. The inclusion of speech here would not only have made the program friendlier, but would also have helped expand the child's vocabulary. Maybe future versions of *The Talking Coloring Book* will be more talkative.

*The Talking Coloring Book* is no competition for powerful graphic programs like *Deluxe Paint II*. There are no options like mirror images, auto circle, add text to a drawing or use brushes offered here. Those are features I would look for in a professional graphic program, but while testing *Coloring Book* I had to keep reminding myself that it was designed for young children — not middle-aged men. Looking for a more objective opinion, I turned to my kindergarten-aged son. He was delighted with the product and in short order wiggled the mouse out of my hand and was drawing and coloring unattended. For him drawing and coloring on a "glass tablet" was just as natural as using construction paper and felt tip pens. What more can I say? *The Talking Coloring Book* was designed for kids and they (or at least mine) found it stimulating and easy to use.

Reviewed by Russ Ceccola

# Legacy of the Ancients

Computer: Commodore 64
Publisher: Electronic Arts
1820 Gateway Drive
San Mateo, Ca 94404
Medium: Disk
Price: $29.95

The man you find along the side of a road was in the process of returning the scroll to the Tarmalon Galactic Museum, its proper home. You must finish his work. . .




Fantasy/adventure games are so numerous in the software world that, when a new game is released, the product must greatly impress anyone who plays a demo version in a store or reads the hype on the box. *Legacy of the Ancients* combines everything dear to the heart of adventurers everywhere. Twin brothers John and Chuck Dougherty created a world called Tarmalon which takes full advantage of detailed graphics and a collection of unique sounds to make your journey through Tarmalon more enjoyable.

The game revolves around a scroll called the Wizard's Compendium which you find in the grip of a dead man lying along the side of a road. This scroll contains the spells of 12 long-dead and powerful wizards of Tarmalon who met to assimilate all of their magic onto one scroll. The resulting creation, the Compendium, was more powerful than expected and the wizards fought over possession of the parchment.

Passed down through the ages, the scroll brought grief and death to anyone in possession of its tattered fabric. The man you find along the side of a road was in the process of returning the scroll to the Tarmalon Galactic Museum, its proper home. You must finish his work by discovering how to neutralize the evil associated with the Compendium and ultimately take the scroll to its eternal resting place in the Galactic Museum.

The Galactic Museum fits into an area of 23 × 22 blocks mapped out on graph paper. It is a testament to Tarmalon, built many ages ago by the Ancients, a strange race of beings that no living being has ever seen. The Ancients built similar museums on other planets that they visited, all containing artifacts indigenous to the planet.

The unique elements of the museums of the Ancients are the displays themselves. To view a display, you need a certain coin to pay for your interest. There are 12 displays in all, including two that require no coin to inspect. *Legacy of the Ancients* starts you off with two jade coins; the Museum contains three displays that use jade coins, requiring you to make a choice from the very start which affects the rest of the adventure. Some displays will give you transportation to other areas of Tarmalon, while others offer useful items or gold. One interesting display houses a game called the Stones of Wisdom which involves betting on dice to increase your character's intelligence. Return to the Museum whenever you get another coin and make a map of the Museum at the start of your quest, so you'll be ready for the dangers ahead.

You see Tarmalon in all its wonder depicted in full-color moving graphics in a viewscreen about half the size of your monitor's screen. The rest of the three-section graphic consists of room for commands at the bottom and a list of all available commands on the left. You select commands by joystick or cursor keys — no typing of commands is required to play *Legacy*—another plus in the game's favor. The joystick does everything a lot easier.

The world of Tarmalon is immense, as you will soon find out when moving your character across a large wilderness and seeing nothing on the screen except for landscape in the overhead view. There are marshes, mountains, rivers, lakes, continents, islands, towns, dungeons, a fortress and a castle. Traveling goes at the pace you want it to, and there is no set pattern to get to your goal; in the end, you will have traveled throughout the entirety of Tarmalon anyway.

There are 12 towns in Tarmalon, each containing a number of places and buildings to aid you in your quest. Possible locations in the towns are: The Bank, The Lending Association, The Foodstore, The Weapons Shop, The Armor Shop, Buy-Back Shops, The General Store, Blackjack Tables and Flip Flop Tables (gambling games), Training Schools, The House of Healing, Magic Shops and Fortune Teller. All of these places assume the personality, names and prices of their particular town. A good idea is to play some serious practice games in which you find every town's location, what they include and how high their prices are.

Obviously, you can spend a lot of time in a town. It might be useful to do some heavy gambling at Blackjack or Flip Flop (a variation of Pachinko in which players bet on where the ball lands at the bottom of the Flip Flop board), so that you have a good supply of money to buy goods, armor and weapons—all necessary for the long road ahead. A good thing about the banks is that you can put money in a bank in one town and take it out in another town, eliminating the possibility of losing all your money in a robbery in the wilderness. Use this option to your advantage.

*Legacy of the Ancients* is essentially a role-playing game in which your character moves up in levels and increases usefulness in various characteristics. You are

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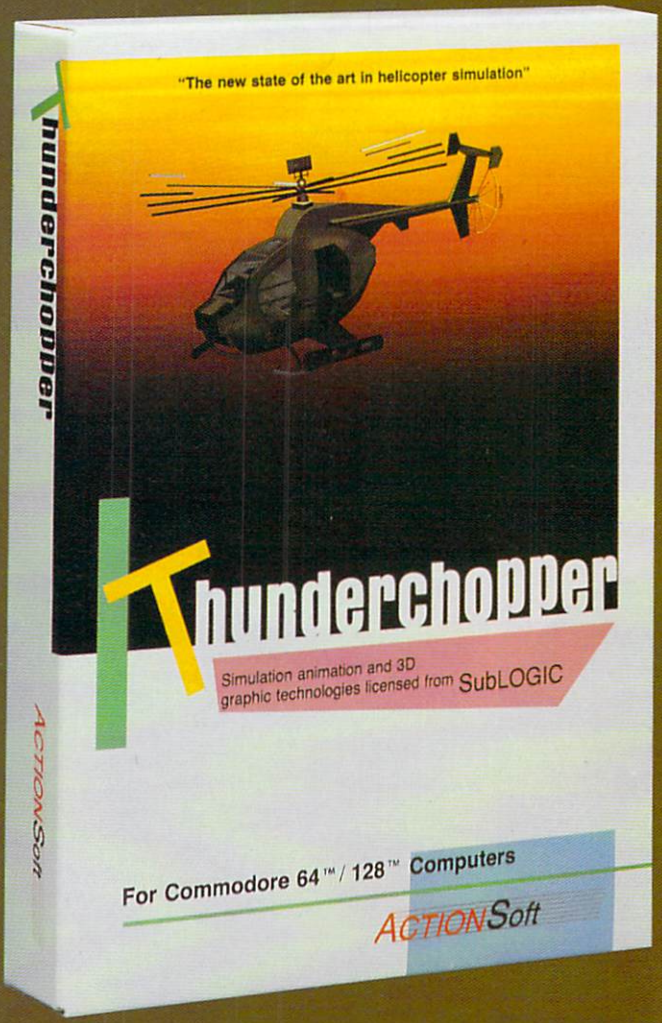
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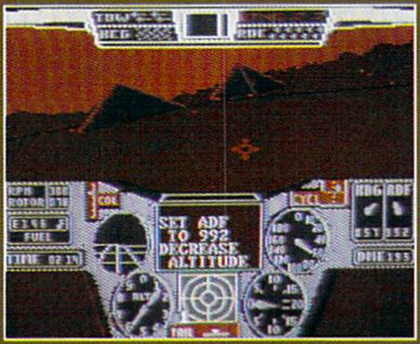







C64 Screens shown. Other computer versions may vary.



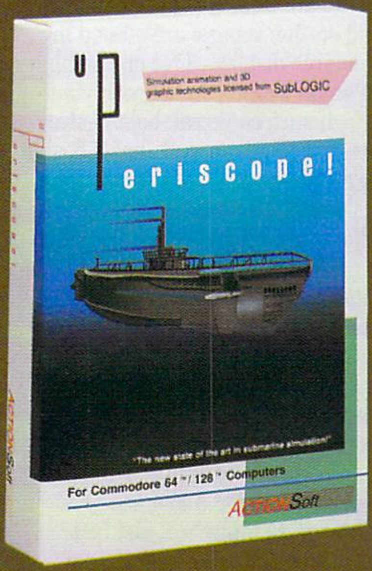







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Reviewed by Mark Cotone

# Up Periscope!

**Computer:** Commodore 64
**Publisher:** ActionSoft
201 West Springfield Ave.
Suite 711
Champaign, IL 61820
**Medium:** Disk
**Price:** $29.95

Once the United States was drawn into battle and WWII kicked into high gear, all eyes turned toward the Pacific, — the stage of the war's most important power struggle. Japan had the early edge, flexing its naval muscle to not only dominate the sea surrounding its mainland, but also to seize and secure an ever-expanding formidable line of defense. Japan's dominance was making it virtually impossible for the Allied surface ships and aircraft to mount any kind of significant attack. But the Allies were still confident, for they had a secret weapon. Figuring that the enemy couldn't fight what it couldn't see, the U.S. placed all hope in its "invisible" attacker: the fleet class submarine.

So the curtain opens on ActionSoft's captivating new simulation, *Up Periscope!* The only force that could effectively penetrate the seas surrounding the Japanese homeland was the American submarines. This program winds back the hands of time and offers you the chance to once again enter these perilous waters as commander of your own sub. From bow tubes to stern planes, the ship's all yours, and although a well-trained crew is standing by to carry out your every order, you alone must make all strategic decisions regarding movement, navigation and ordnance control.

Your vantage point throughout the game is from the ship's bridge — the nucleus of all combat action. To help you carry out your duties, the game's main screen has been halved horizontally, allowing you to check on a number of the sub's activities with a quick glance. The bottom portion of the playfield houses a panel of instruments and gauges displaying all the important information needed to run the vessel. The top half of the screen provides a vivid, three-dimensional view of the ships, sea and shoreline surrounding your sub. Depending upon your vessel's depth, these visuals are seen through either periscope or binoculars. Both can be panned full circle in either direction and contain variable-powered lenses, which allow you




As Captain, you'll often find your attention divided between a series of responsibilities all requiring constant inspection.

to zoom in for a close-up look-see.

Aside from this principle playfield, there are also six auxiliary screens with additional on-board information. These include a pair of navigational charts, a Radar Scope, a Damage Report, a Patrol Report, and a Torpedo Data Computer (TDC), which helps the skipper compute a torpedo launch course based on calculated target specifications. As Captain, you'll often find your attention divided between a series of responsibilities all requiring constant inspection. The implementation of orders is greatly facilitated by a logical organization of keyboard controls, all backed by a handy reference card which clearly outlines the operational options.

*Up Periscope!* reaches authenticity on every level. Graphically, the visuals are crisp, clean and believable. On board, maps are drawn with detailed precision, instruments are clear and easily monitored, and station reports are offered in colorful, legible displays. Out on the high seas, the ship's actions are smoothly animated. Each surface vessel, be it destroyer, tanker, cargo or transport, has a design and look all its own. If a ship turns for a chase, its detailed structure takes shape as it stalks in close for the kill. Launch a torpedo, and a visible wake slowly drifts toward its target. Hits are signaled with an explosive geyser of water as contact is made, either immobilizing the ship or sending it on an agonizing, twisting roll into its watery grave. And in the event that your missile strays off target and the enemy completes its ramming run before you can dive, you'll get a low, sea-level view of a large looming hull just before impact. Fatal, but fascinating.

To augment the visual realism, ActionSoft adds all the appropriate audio extras. The incessant pinging of the sonar rings clear, mixing with an assortment of informative sounds that help to signal the ship's status. Diesel engines run with a rough growl, while electric motors give off a low hum. Torpedoes leave their tubes with a quick hiss, move away with a fading whir, and meet their target with a distant, metal-shearing blast. The hull creaks under the weight of the sea, the Klaxon sounds before a dive, and a beeping alarm calls for immediate attention whenever damage is sustained.

When we delve beneath the superficial audio/visual appeal of this program, it comes as no surprise that the underlying action is both exacting and engaging. The combat realism is taken to such a level, that not only is your vessel responsive to your commands, but the enemy ships will also act and react depending upon your tactical moves. Pop up in one location and draw attention to yourself, then dive and run, and you might be able to spread out a larger convoy, making them more susceptible to a damaging attack. When the enemy is converging on your position, dive deep, cut the engines and lay low, and there's the chance that you might be passed over. You can even jettison some fuel and debris from your ship after an unsuccessful depth charge run, hoping that the Japanese, interpreting this as a sign of a fatal hit, will believe themselves victorious and sail away.

ActionSoft offers a number of different game scenarios to test your command skills under a wide variety of conditions. For plebes, a Pacific Patrol option is available to help you familiarize yourself with the battleground without encountering the enemy, and a New London Refresher assignment is also offered to let you hone your skills with live torpedoes. From there, it's off to a number of genuine wartime reenactments, which let you go on some of the same historic submarine mission that U.S. ships carried out in the 1940's. Limited visibility, unproven "dud" torpedoes, and hazardous, uncharted atolls are some of the many recreated obstacles to victory. To make this precision simulation accessible to all, a ten-point options menu is included to let you tailor each mission to match your skill. Everything from hull thickness to enemy expertise can be altered, allowing you to stack the deck as you see fit.

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Reviewed by Russ Ceccola

# The Lurking Horror

| | |
|---|---|
| Computer: | Commodore 64, Amiga |
| Publisher: | Infocom<br>125 Cambridge Park Dr.<br>Cambridge, MA 02140 |
| Medium: | Disk |
| Price: | \$34.95 (Commodore 64)<br>\$39.95 (Amiga) |

Think back to when you were in high school or college taking that computer programming course. You had to use the school's computers and, for the most part, they were never available in the daytime. People fought for access to the computers and, because of your late classes or general laziness, you often wound up in the computer room in the middle of the night to do your work. As a member of the "3 A.M. Club," you wandered the halls of your alma mater after hours, taking a break from fighting with the computer's inadequacies. Did you ever wonder what went on behind closed doors in the school at night? What exactly was that strange noise you just heard, and who turned on that light in the room you just passed?

Questions like these and others are answered in excruciating detail in one of Cambridge-based Infocom's newest games, *The Lurking Horror*. As the eighth work of interactive fiction from veteran game designer Dave Lebling, *The Lurking Horror* is also Infocom's first endeavor into the realm of horror. When asked why he chose a horror game, Lebling replied: "When I was a kid, I was interested in horror movies and books, as well as science fiction and fantasy. In particular, I read some of H. P. Lovecraft's works and they made a lasting impression. I began to pick up some of his writing again a year or so ago and found myself reacting not as much to some stories as I did when I was young, but at the same time being terrified by others that hadn't affected me at all before. I thought that horror would be a neat theme for a game and went ahead with my plans."

In *Horror*, you are in the Computer Center at G.U.E. Tech with a twenty-page paper due tomorrow morning and a raging blizzard outside confining you to the building. It is the middle of the night and there is no one else in the center except for a hacker who looks familiar. While editing your paper, you find that it has been replaced by text that looks all too familiar, and you are drawn into a nightmare that won't end until you've found out what happened to your paper (or at least finish your Classic Coke). In the process of exploring G.U.E. Tech in search of the lost paper, you find other presences not altogether pleasant.

> While editing your paper, you find that it has been replaced by text that looks all too familiar, and you are drawn into a nightmare that won't end until you've found your paper.

*Horror* is an all-text game in which you type in simple commands at a prompt in response to computer descriptions and other consequences of your actions. From commands like "Go West" to ones like "Throw the Funny Bones at the Creature," the story happens according to your actions alone. If you choose not to do anything important and instead enter commands like "Examine Me" and "Scream," be warned that you may be wasting valuable game time on nonsense actions. What distinguishes Infocom games from all other text games is that you have the option to do almost anything you want to do in that universe-on-a-disk. *Horror* is no exception, and you'll be surprised by the vast number of options at your disposal at every prompt from the computer.

G.U.E. Tech mirrors nearby M.I.T., according to Lebling, and he designed the geography for the game locations based on an existing map of M.I.T. Lebling describes the background of G.U.E. Tech: "My theory is based on H. P. Lovecraft's fictitious Miskatonic University. It was obviously a very small school, and Lovecraft's Miskatonic River was the fictional counterpart to Massachusetts' Merrimac River. After all the troubles at Miskatonic in the 20's and 30's that Lovecraft wrote about, the town that the school was located in ran into financial difficulties. As a result, it and several other small schools merged to become G.U.E. Tech, thanks to the great bequest made by George Underwood Edwards. G.U.E. Tech is the lineal descendant of Miskatonic."

Regardless of affiliation, G.U.E. Tech contains within its walls many unspeakable things that I won't speak about, because I don't want to ruin the game for you. Horror fans will love all the descriptions that Lebling sprinkled throughout the game, and Lovecraft fans will scream with delight at all the inuendos present in *The Lurking Horror*. The game is the first normal difficulty game Lebling has designed since Zork I. When you ultimately finish the game and take part in a dramatic and involved climax, you'll be begging for more. *Horror* pushes you to the limits of your puzzle-solving capability and mental capacity and offers all that interactive fiction fans have come to know and love.

Lebling wrote *Horror* in a prose style reminiscent of Lovecraft's. A typical description in the game is: "A thick black mist begins to form in the room. Parts are darker, and parts lighter, and the dark parts form a disturbing shape. The professor chants and calls more loudly now, his voice rising in a kind of hysteria, and you realize the calls are being answered."

Lebling explains his motivation for writing in this style, "That was intentional. I wanted to write something that was basically Lovecraftian, but set in a Stephen King kind of world. One of the things that King does is ground his stories in the real world with believable people and brand names. That's why I included Classic Coke and Funny Bones instead of soda and a snack." Lebling's attempts were successful, for the game reads like a good horror novel. Your mind must be bent in the same way. In dealing with the denizens of G.U.E. Tech's hidden rooms and underground passages, don't always try the normal approach to a problem. Look for an easier way out or one that includes a touch of the supernatural.

Lebling gave me a piece of advice in playing his games which applies to *Horror*, "In almost every game I write, there is a maze—but I hate mazes. So, if you find a maze in one of my games, the chances are very, very near 100% that there's a trick, and if you figure out the right thing to do, it's not a maze." The maze in *Horror* appears later in the game, but you have to figure out how to get through it.

Lebling included many objects and

*Continued on pg. 36*

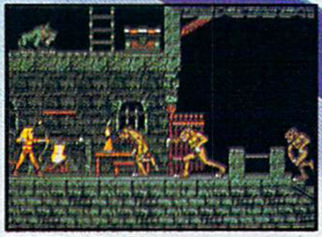
# THE BARBARIAN HAS ARRIVED! THE TERRORPODS ARE COMING!

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**S E E I N G   I S   B E L I E V I N G**

*Continued from pg. 34*

situations closely related to his days at M.I.T. which make the game more interesting to play. For instance, the brass

> "I wanted to write something that was basically Lovecraftian, but set in a Stephen King kind of world."

hyrax you eventually find is a tribute to M.I.T.'s class ring, lovingly referred to by alumni as the "brass rat." The ring depicts a beaver sitting atop a bunch of twigs with one in its mouth. The year of graduation is spelled out with twigs as well. The maintenance man in *Horror* is just like the ones Lebling and his friends encountered when they took exploratory late-night breaks in the basements of M.I.T. Similarly the rats you encounter in one of the sub-sub-sub-basements at G.U.E. Tech were a reality once for Lebling and his cohorts as they explored a dark basement and saw hundreds of tiny beady eyes staring back.

*The Lurking Horror* is an excellent journey into horror interactive fiction and, as Infocom's first such attempt, has earned its place along the other all-text games in Infocom's library of 30+ titles. Lebling set out to create a world populated by the terrifying and unexpected and, as you progress in the game, you'll be surprised at what you find. Save your game often, for there are many chances for the words "You are dead" to pop up on the screen. The terrain for the game is not too complicated to map, but be especially careful in the way you arrange your boxes representing rooms in the southeast corner of the map.

In closing, here are some words of advice: Most importantly, remember that most objects you find are needed for two purposes. When done with an item for a puzzle, leave it where it can easily be retrieved. Carefully read the descriptions of characters and places given in the game. Both contain important clues in solving puzzles later in the game. Try pouring some Classic Coke on the pentagram and read the graffiti in the elevator several times. Finally, carefully examine the enclosures that come with *Horror*. Included in the game package are a G.U.E. Tech student identification card, a Guide to G.U.E. Tech and a plastic bug. Some of the information contained on and in these enclosures is necessary to finish the game. ■

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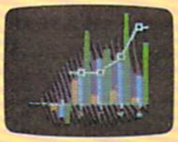
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Reviewed by Rich Budnick

# Buyer's Guide to Dvorak Keyboard Software

*Faster, Better Typing*

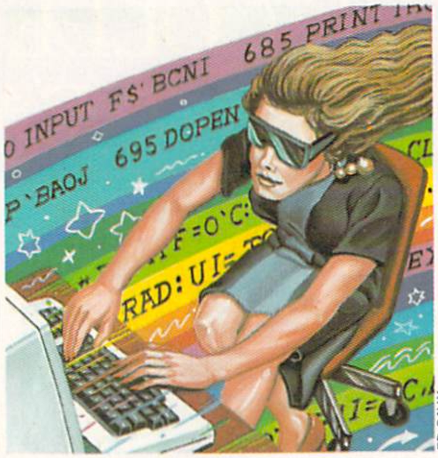
You too can type (input) faster and more accurately on your Commodore than you would have believed possible. The solution is simple, easy to learn and inexpensive. It's an old idea that's gaining popularity.

Here's what you do: just convert your hardware or acquire software to a Dvorak keyboard system. "What's Dvorak?" you ask. The Dvorak keyboard rearranges the letter keys so the most frequently used letters are next to each other. People who use the Dvorak keyboard type an average of 30% faster, make fewer errors, and suffer less fatigue. It's not uncommon for Dvorak users to type in excess of 100 words per minute. If you ever wondered how champion typists do it, here's their secret: many use the Dvorak keyboard.

In 1936, University of Washington Professor August Dvorak calculated the frequency that we use each letter of the English alphabet. Then he designed a typewriter keyboard, placing the most often-used letters on the home row. This keyboard realignment makes typing more scientifically efficient. Approximately 70% of all Dvorak typing can be accomplished without lifting your fingers to reach another row.

In contrast, the standard keyboard layout we use on our Commodore computer (known by the letters "qwerty"), was designed with the most commonly used letters spaced far apart. This keyboard, designed in 1872, was deliberately intended to prevent a fast typist from making the keys jam or stick. Obviously, the traditional keyboard wasn't intended for speed or efficiency. Now that we have computers the traditional keyboard is outmoded. Key-jamming while inputing doesn't occur. The Dvorak keyboard makes typing a more enjoyable experience.

More than 100,000 people use the Dvorak keyboard, including 40,000 AT&T directory-assistance operators nationwide. Virginia Russell of Dvorak International says 20 federal government agencies are




ED SAUK

If you ever wondered how champion typists do it, here's their secret: many use the Dvorak keyboard.

now considering the Dvorak keyboard as a way to improve worker productivity and save tax dollars. Such a conversion may launch a nationwide shift to Dvorak in government, business and the home.

If you're impressed with the productivity and efficiency potentials of Dvorak, you'll be glad to know Dvorak capabilities are available to Commodore users as optional hardware or software conversion.

## Keyboard Cadet

Mindscape's *Keyboard Cadet* teaches you to touch type the Dvorak system with an exciting software program that prides itself as being neither dull nor boring. "This typing program is designed as a game format to make typing fun for people of all ages," says Charlie Schaff, Product Development manager for Mindscape. "It takes an average person a couple of weeks to unlearn Qwerty and learn a new system."

*Keyboard Cadet* is easy to use. Just boot it up, and you're ready to go. The menu asks for standard or Dvorak. The program takes you through 15 typing lessons, each taking only 10-15 minutes.

Whole words appear in blue on the top half of your screen, as if you are looking though the window of a spaceship. Individual letters you should type appear in yellow, but they flash in red if you type the wrong key.

*Keyboard Cadet* is the first product to display a screen with a diagrammed keyboard, and a pair of three-dimensional, animated hands. These hands teach proper hand positioning and correct finger reaches. The program is based on educational principles that teach proper touch typing, not "hunt and peck." The touch typing instructions are based on the method system of SFN, a subsidiary of the nation's leading publisher of typing products for schools.

*Keyboard Cadet* works with the 64 or 128 in 64 mode, and costs $39.95. It is sold by Mindscape, 3444 Dundee Rd., Northbrook, IL 60062. Phone (800) 221-9884.

## Speedpak

Here's a software conversion program for those of you who already know how to type with Dvorak. You can toggle easily between Dvorak and Qwerty with the control key. *Speedpak* features an innovation that allows you to edit two documents instantly from a divided screen. It also has a fast RAM-based mail merge, a help screen and an on-screen font installer.

*Speedpak* is an enhancement for *Speedscript* v. 3.0, 3.1, or 3.2. You must use *Speedscript* the first time, but then you can save both as a unit, so you only need to load *Speedpak* in the future. It takes five seconds to load *Speedpak*, and you don't waste time inserting disks.

*Speedpak* works with the 64 only and is sold by Upstart Publishing Co., Box 22022, Greensboro, NC 27420. Phone (919) 379-9732. *Speedpak* costs $17 plus $3 for handling. Upstart also sells *Speedscript* for $20 plus $3 for handling.

## DV Typer and DV Switcher

Prelco sells two Dvorak-related products: a software keyboard conversion typing tutor, *DV Typer*; and a hardware conversion, *DV Switcher*.

*DV Typer* teaches you the Dvorak method with your 64 or 128. You also get a 22-page Dvorak typing instruction book and Dvorak/Qwerty key overlays. A user-friendly menu allows you to choose and save colors, load, write and run BASIC programs. *DV Typer* works easily with the 64. Just turn it on, load *DV Typer*, and run it. You can autoboot *DV Typer* with the 128, so it also becomes a software conversion for word processing. This keeps the Dvorak keyboard and enables you to utilize BASIC and commercial programs.

*DV Switcher* is a ROM kernal kit which enables you to type with either Dvorak or

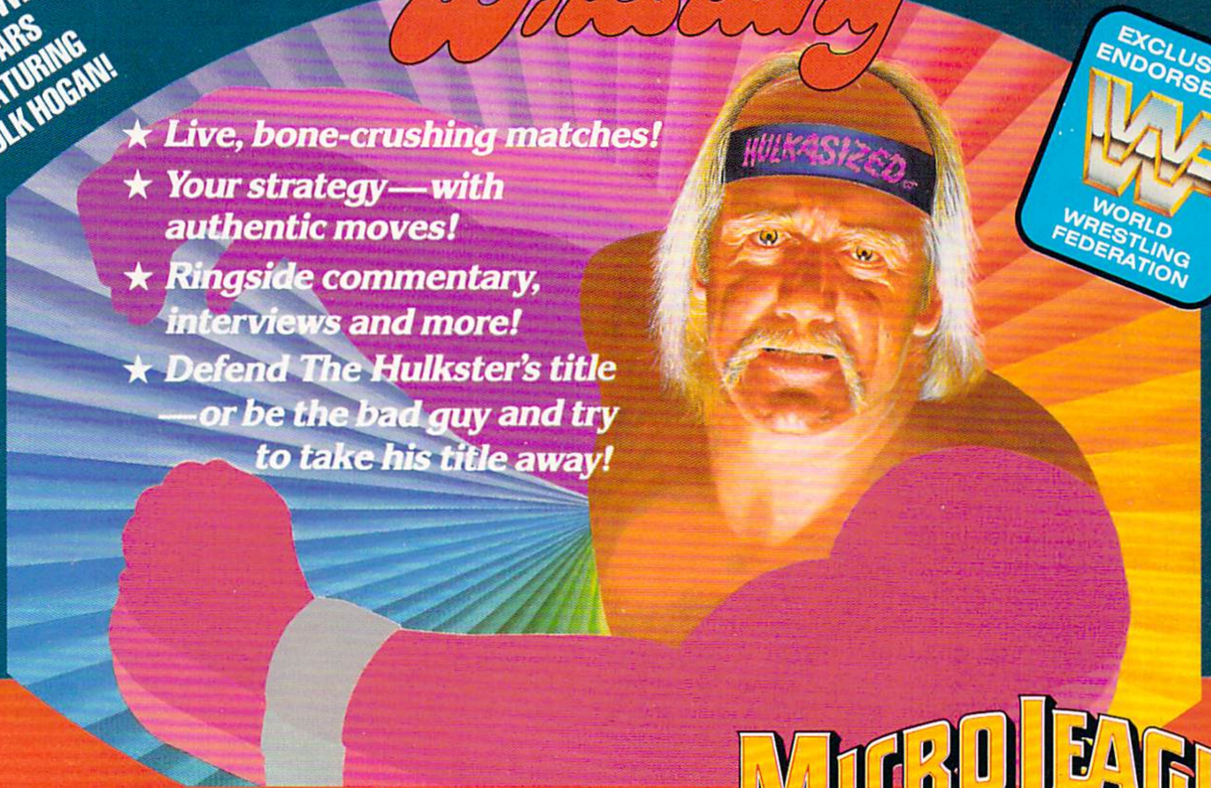
*Continued on pg. 122*

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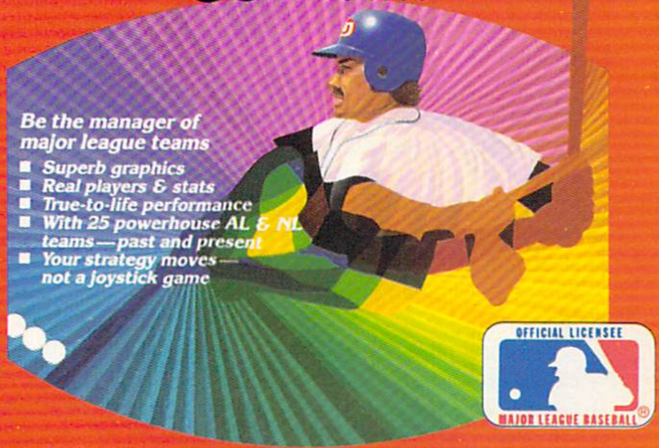
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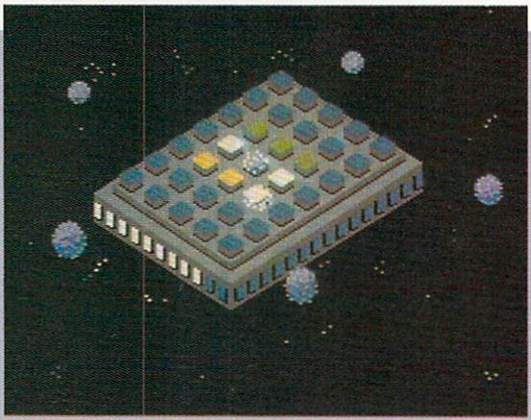
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Reviewed by Scott A. May

# Sigma 7

**Computer:** Commodore 64
**Publisher:** Avantage/Accolade, Inc.
20813 Stevens Creek Blvd.
Cupertino, CA 95014
**Medium:** Disk
**Price:** $14.95

Accolade proudly throws the notion "you get what you pay for" out the window.



With the introduction of its Avantage line of budget-priced software, Accolade proudly throws the notion "you get what you pay for" out the window. Avantage not only gives relatively unknown designers a wide forum, but it also presents quality original software at reasonable prices. *Sigma 7* is one of the best titles to emerge from this promising new label.

*Sigma 7* benefits from a renewed interest in home arcade games, blasting its way onto the screen with pulsating graphics and finger-numbing action. *Sigma 7* is a joystick jockey's delight.

The game is a marvelous crossbreed of coin-op classics and new technology. The theme is certainly familiar: A savage alien race is constructing the most deadly battleship in the galaxy, code-named Sigma 7. Your job is to infiltrate the alien factories, decipher the destruct code and halt operations. Crisp graphics and smooth player control transform this mundane scenario into an exciting and pleasantly difficult arcade contest.

The game contains three phases or subgames arranged in seven levels of increasing difficulty. Players begin the game with three "lives," gaining three additional lives for completing each phase. As an added distraction, phases two and three impose strict time limits for completion. If all lives are lost, or time is exceeded, the game ends.

Phase one finds your spacecraft launching from its base in search of the alien factory. Against a backdrop of twinkling stars, wave after wave of alien space mines attempt to intercept your ship. Although they do not fire, the space mines swarm in deadly formations. Any contact will cause your ship to explode, losing one life.

This first phase is highly reminiscent of classic arcade games such as *Zaxxon* and *Galaga*. Joystick control is tight and responsive in both movement and firepower. The action unfolds fast and furious, especially at higher skill levels. The only drawback is a curious lack of depth; all ships operate on a two-dimensional, diagonal plane. The ability to move above and below the playfield would elevate this phase to perfection.

Each wave of alien mines enters the screen from behind your ship on either side. On this initial pass they fly harmlessly by, splitting apart and reforming for attack. The trick here is to follow their lead, blasting as many as you can from the rear. This leaves fewer to contend with as they regroup for assault. Spread your fire with quick bursts, concentrating on the last space mine in formation. Left untouched, this little devil will often home-in on your ship, from which there is no escape.

If you survive the space mines, your ship will dock at the alien space factory. Here you begin phase two, an encounter with the factory's deadly robo-mines. The factory area consists of numerous pathways filled with dots and randomly-generated alien mines. Your task is to clear the pathways of dots before time runs out. The slightest contact with the randomly-generated alien robots spells instant death. They must be avoided with careful maneuvering or destroyed with your laser cannon.

Phase two is a clever twist on the *Pac Man* theme which most players will find difficult and entertaining. The diagonal movement and textured graphics add perfect detail to a familiar premise. Not all dots can be cleared from the pathways, however. Those remaining form a special pattern, or code, that must be memorized for use in the next phase. The factory's layout — and final code — increases in difficulty at higher skill levels.

The best tactic here is to keep moving, concentrating on the path before you. Prepare for tight cornering and avoid dead ends, as robo-mines often materialize directly behind you. Keep a scrap of paper handy when the dot patterns eventually appear. Pause the game using the F7 key and carefully draw the pattern for use in the next phase.

A red spiral at the top of the screen decreases in length with each passing second. When the spiral turns white, you may exit at the far end of the factory. If time runs out, however, the game is over. Bonus points are awarded for completing this phase with time remaining.

The final phase incorporates the secret code into a puzzle similar to a space-age Rubik's Cube. Players move about a structure (the factory's Control Unit) containing a series of blinking multicolored cubes. During play the cubes constantly change color from green to red and then yellow. The object is to turn yellow cubes "on" (white) by pressing the firebutton, forming the same patterns revealed in the previous phase. Unfortunately, an alien defense system tags behind you at all times, undoing your handiwork. Complete this stage and you will begin phase one again at a higher skill level.

Phase three is the game's most obscure and difficult segment. Success on this phase requires fast reflexes and nerves of steel. Lights on the side of the structure light up as time counts down. If the time limit is exceeded, the game ends.

A vanity board saves the top five scores and player names permanently to the game disk. These scores can be viewed before each game (giving players something to shoot for). Finally, expert players may begin the game at any of the seven skill levels.

*Sigma 7* is a strong arcade contender, comparable in style and energy to its coin-op cousins. It is also a perfect introduction to the Avantage line of low-priced software titles. Fast-action fans will find a lot to like in this well-constructed game. ■

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Reviewed by Matt Blais

# Professional Text Engine, V1.0




**Computer:** Amiga
**Publisher:** Zirkonics Corporation
422 Guy
Montreal, Quebec H3J 1S6
Canada
**Medium:** Disk
**Price:** $79.95

*Professional Text Engine* is a screen-oriented text editor for the Amiga written by a programmer for programmers. It is a very powerful and versatile program. Although it bills itself as a "What-You-See-Is-What-You-Get" editor, it is not well suited for word processing, as it lacks the capability for printer control, page formatting and displaying different fonts and text styles, such as boldface and italic.

## Program Features

The *PTE* disk comes with all the appropriate icons to allow it to be run from Workbench, but it can also be run from the CLI. If you boot your Amiga from the *PTE* disk, *PTE* will load a special font which gives some of the normally unused character codes definitions which are used for drawing text boxes in the *PTE* "help" screens. This means that if you booted your Amiga from a disk other than the *PTE* disk, your *PTE* help screens will be barely readable, covered with the little rectangle characters that normally are displayed for unprintable characters.

A vertical scroll bar is a welcome sight on PTE's window. A horizontal scroll bar would have been nice too, but would take up one more precious line of the display. *PTE* reserves three lines at the bottom of the screen for the Command line, Status line and Message line, leaving you with a maximum of 20 lines of viewing area for your text. Even when running in an interlaced screen, *PTE* will not let you re-size its window to more than 200 raster lines, the maximum size for a non-interlaced (Workbench) display. *PTE* can edit multiple files simultaneously. There is only one *PTE* window, so you must "flip through" the files currently being edited, or select one by name. Each file retains its own cursor position, tab stops, margins, and other user-changeable settings, and when you select a file, its tabs and other parameters become current.

A unique feature of *PTE* which sets it apart from other text editors is its programmability: virtually every key can be redefined to perform the function of your choice.

A very thorough (and thick) manual is included with *PTE,* which includes plenty of examples. Unfortunately, it is not spiral bound, and snaps shut the minute you look away. It is divided into a table of contents, an index, a nine-chapter tutorial section where related commands are explained and grouped together, and an alphabetically organized reference section. The index covers all of *PTE's* commands and refers to both the tutorial and reference sections of the manual, but is otherwise a bit skimpy. The organization of the tutorial section makes it useful for reference as well as for learning *PTE,* since all functionally-related commands (for example, all cursor movement commands) are grouped together.

Help screens can be summoned with a touch of the HELP key or from a menu. Pull-down menus simplify life and aid in speeding up the process of learning *PTE.*

A unique feature of *PTE* which sets it apart from other text editors is its programmability: virtually every key (including those which are CTRLed, ALTed, CTRL-ALTed, etc.) can be redefined to perform the function of your choice. *PTE* has an entire text-editing language built in with well over 100 commands, conditionals, looping constructs, flags, and variables. So if there is no built-in command to perform the function you need, you can quickly write a macro and assign it to a key. In fact, *PTE* comes with several different "configuration" files, each of which is tailored to a specific text-editing need: *WordStar* emulation, C source code editing, and Amiga Assembler editing are examples. These configurations are macro files which define new functions (macros) and assign them to various keys. The C source code configuration, for instance, programs one key to check for unmatched brackets and parentheses. Separate help files are included for the different configurations since the functions assigned to some keys differ between configurations.

## Versatility is the Word

*PTE* features an Undo command and also has the ability to recall all of your previously typed commands (a la UNIX "history"), so you never have to worry about retyping a long command line if you make a mistake. Function keys (alone, shifted, ALTed, CTRLed, and in combinations) are all programmable, as are both mouse buttons, mouse button combinations and the menus. A special "key" called the ZZ-99 key can be programmed to execute before every keystroke, providing an easy way to do exotic things like automatically typing vertically or backwards, or inserting a space after every character typed.

In addition to programmable flags and variables, there are also stacks available which are useful for keeping track of things like multiple marked areas of text and cursor positions, allowing for some very complex text manipulation functions.

The standard Insert and Replace text entry modes are supplemented by a unique "squeeze" mode (a combination of insert and replace), which is useful for working with columns of text without disturbing column alignment.

Another rare but useful feature of *PTE* is its ability to move, copy, overlay, fill, sort, center, justify (and do countless other things) to rectangular blocks of text, in addition to the more common character- and line-delimited text ranges. This means you can select a vertical strip of text from the middle of your file and shift the entire block left, or do whatever else to it. This is one feature I always missed in other editors.

*PTE* provides a versatile way to "transform" the name of the file you are editing into a different name (for example, change the filename's extension to ".bak" and the directory name to "backup") to make backups of the original file before replacing it and to generate state file names.

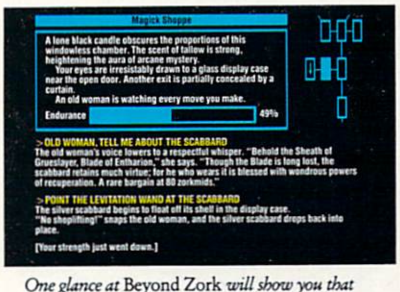
*Continued on pg. 110*




The *Zork Trilogy* has become a legend in its time, selling nearly one million copies! Now the legend continues with an extraordinary new Zorkian universe that breaks ground in computer gaming. For the first time, the character-building and combat of role-playing games joins the masterly prose and puzzles of Infocom's interactive fiction.

*Beyond Zork's* sophisticated new interface makes interaction more natural than ever, plunging you into a world teeming with magic and peril. The vast and varied Southlands of Quendor come alive as you seek fantastic treasure and combat the vicious monsters who haunt the streets and wastelands.

Challenge yourself to a quest that's far beyond anything you've ever experienced. *Beyond Zork.* The incredible new interactive story from the master storytellers at Infocom.




*One glance at* Beyond Zork *will show you that it's unlike any interactive story you've seen before. On-screen mapping. Window displays. A character that grows in strength and power. You get all the excitement of role-playing games, skillfully blended with the fabulous puzzles and award-winning prose of Infocom's interactive fiction.*

*Screen shown is for the Commodore 128 version.*




**INFOCOM**™

125 CambridgePark Drive, Cambridge, MA 02140

Beyond Zork *is available at your local dealer for the Apple II series, Macintosh, Commodore 128, Amiga, IBM PC and 100% compatibles, and Atari ST. To order direct, call 1-800-262-6868. Coming soon: Apple IIGS.*

Zork *is a registered trademark of Infocom, Inc.*

Reviewed by Mark Cotone

# Superstar Ice Hockey

**Computer:** Commodore 64
**Publisher:** Mindscape, Inc.
3444 Dundee Road
Northbrook, IL 60062
**Medium:** Disk
**Price:** $34.95

Introducing *Superstar Ice Hockey*, a new offering from the Mindscape SportTime line that lets you experience all the delights and frustrations of owning your own sports franchise in an authentically recreated, highly competitive major league environment. Your hockey team is just one of twenty vying for the coveted championship cup, and this time it will take a little more than luck to bring the prized trophy home. Ed Ringler, the program's designer, has created a simulation with substance — a deep and demanding contest that will require you to be a combination businessman, strategist and supple-wristed joystick jockey in order to gain success. It's a crowd pleasing software hat trick that scores with every shot.

The first time this program is approached, your hockey team is introduced as one of the four new expansion clubs about to begin their inaugural season in the prestigious SportTime Hockey League (SHL). The sixteen established teams that formerly comprised the entirety of the league have a nine-year head start on your club, and their immediate plans are to use you as the divisional doormat. Your job is to gain some respect. The records and rosters of your opponents have been made readily available and can be researched at length in order to size up the competition. Teams are named after the cities they represent, and National Hockey League fans will be pleased to find many of their favorites waiting to be tested. True to the final NHL standings over the past few seasons, Edmonton, Philadelphia and Washington appear to be the powerhouses, closely trailed by such perennial contenders as Calgary, Boston and Montreal. Any realistic chance of your team achieving championship status is still a couple of seasons down the road.

The SHL offers three options in this construction process: recruiting, where you replace lackluster and aging roster members with some fresh blood from the minors; training, where you aim for general improvement by sending the whole team away to camp; and trading, where you wheel and deal with the other franchises in an attempt to quickly strengthen your team's weaker links. To keep the reins on these club refinements, the league charges "trading points" for each ameliorative attempt. Initially, new franchises are granted 250 points to start with, and at the end of the season, depending upon each team's final placement in the standings, additional trading points are awarded on a proportional basis, with the cup winner receiving the smallest allotment. Kudos to Mindscape for devising and incorporating such a system, for it tends to promote parity, keeping the league competitive and the matches exciting. The SHL even arbitrates all trade offers, so that you can't go about exchanging players without league approval (just in case you were thinking of persuading the unwitting computer controlled squads to accept an assortment of scrubs for a gaggle of Gretzkys).




Once your roster is fine-tuned and the season begins, it's time to don your coach's cap and scout the opposition as you prepare your players to meet their various rink rivals. Before each game, strategies must be weighed and positions assigned.

It's a stimulating mind game between benches, with coaches squaring off in a sort of accelerated chess match constantly trying to outsmart their counterpart by positioning, blocking and shifting players. Since ice hockey is one of the fastest team sports in the world, you had better keep pace with some lightning fast thinking, or you're certain to find yourself on the short end of a lopsided score. Luckily, Mindscape has some sense of sympathy, for they've included an option that affords the unfamiliar or overwhelmed user the chance to hand over all the coaching duties to the computer. So if you're new to the game, or would rather concentrate on another aspect of play, you can still remain in the hunt by placing your team in the capable hands of your Commodore coach.

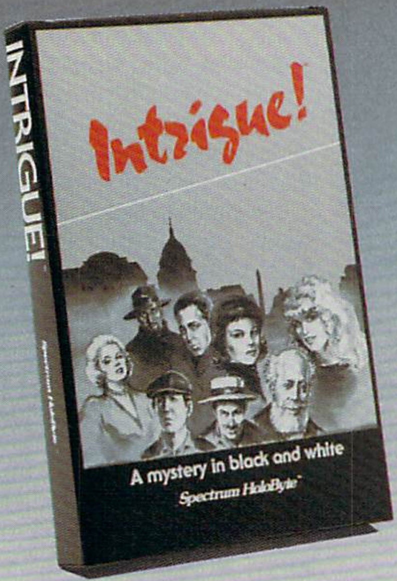
In the SHL you are granted control of either the center or the goalie. That's it. Unlike other computerized hockey contests where your joystick control constantly shifts to direct the actions of the player closest to the puck, the SHL assigns you a specific player, and he's yours for the duration. As center, this unique method allows for a little more flexibility in play development, for now you can not only shoot, pass and skate with the puck, but you can also make your presence felt with some tactical maneuvers away from the play. And if you choose to take the goaltender's position between the pipes, you can go beyond the usual pad save contributions by taking a more active role in play development, using some Hextall-like clearing passes and legal interference to launch your team up ice. All of your surrogates' actions are controlled with a few easy-to-learn joystick taps and tugs. And you're not alone. The rest of your program-controlled teammates will lend some uncannily accurate support, with tenacious defensive play, crisp passes, and slick skating. And once again, if the user is either arm weary or more of the spectator sort, the computer will be glad to take control of all the players on the ice, leaving you to attend to other team needs.

Visually, *Superstar Ice Hockey* is viewed from the expensive seats, just above the playing surface at center ice. Players whiz end to end in fluid animation as the screen scrolls to keep a close eye on the game. Shooters crank blasts from all angles, sending the rubber flying at varying speeds and heights at a goalie who sprawls one way to stack the pads, and then darts back to kick out a loose puck. Players level one another by cross-checking, slashing and hooking with their sticks, obvious infractions that are only occasionally called by the official in the zebra suit. This is unprecedented hockey realism, authenticity that goes beyond good looks. You can actually chart the career of a player over several seasons, from his rookie year with his inexperience and poor mechanics, through his glory years, where time and training built him into a club leader, and into retirement, where the wear and tear of the game finally cause him to realize his limitations. Mindscape has even gone so far as to include psychological factors in play, as team members ride the emotional ups and downs of the game. If a forward line

*Continued on pg. 125*

# SPECTRUM HOLOBYTE PRESENTS...

## A MYSTERY IN BLACK AND WHITE




**INTRIGUE!**
The plot thickens...Someone kidnapped your brother, Joe! Was it the hard-boiled agent, Kruger? The urbane third-world ambassador? His gorgeous secretary, Lisa? Why does the Post reporter-lady know so much? You'll find out "who dunnit" by talking with the people you meet in D.C.'s streets, hospitals, bars, malls, embassies...Listen to what they say and watch their expressions change. There are over 2000 solutions! Solve cases yourself at three levels of difficulty or compete with up to 3 other players. Pick either male or female interaction. Good luck unraveling your next INTRIGUE!


Apple // Version

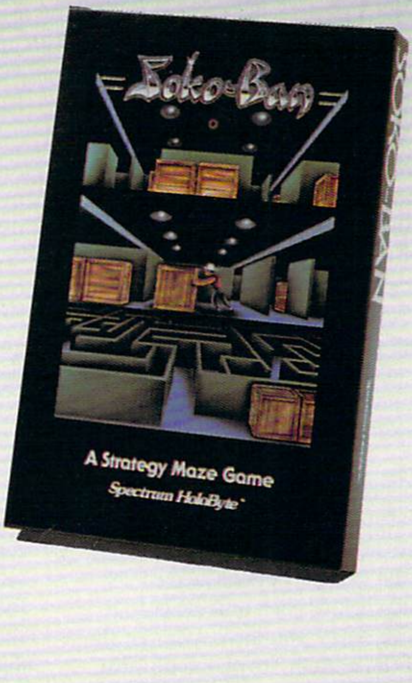
Available on Apple // 48K and Commodore 64K

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Available on Commodore 64K and IBM 256K


IBM Version




**Spectrum HoloByte™**
2061 Challenger Drive   Alameda, California 94501   (415) 522-3584

Reviewed by Tim Jones

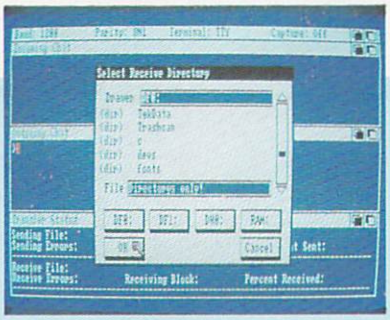
# Diga!

**Computer:** Amiga
**Publisher:** Aegis Development
2210 Wilshire Blvd., Suite 277
Santa Monica, CA 90403
(213) 392-9972
**Medium:** Disk
**Price:** $79.95

Aegis Development has a new product for the Amiga series that's a little out of step with their usual graphics-oriented programs. *Diga!* is a new form of telecommunications program that allows simultaneous file transfers between users while allowing them to chat together during the transfers. This feature is referred to as "DoubleTalk" *Diga!* supports Xmodem, Xmodem-CRC, Ymodem, CompuServe's B protocol, Kermit and ASCII protocols for file transfers. *Diga!* includes emulations for TTY, ANSI, VT100, VT52, and Tektronix 4010/14 terminal types. And if these packaged emulations weren't enough, Aegis has made it possible for you to create your own emulations. There is also a Remote feature that allows callers to operate your Amiga from their end as if it were a limited host/server system.

As telecommunications programs go, *Diga!* is quite a bit above average due to the wide variety of options available to the user. With the large number of supported transfer protocols and emulation capabilities, *Diga!* can be used with any BBS and host/server system that I have ever run across. You have the capability to define which font will be used for display, how many lines will be displayed, whether to use an interlaced screen and the ability to use overscan to actually use the entire monitor screen for display. *Diga!* incorporates a very complete, yet easy to program, script language. The language reads a lot like BASIC, so most users can pick it up with ease. The authors have included sample scripts as examples for you to use.

The phonebook function, like *Diga!*'s other features, is completely Amigatized. There are sliders and buttons that make setting the various options as easy as point and click or click and drag. In a phonebook entry, you have room for the name of the system, its phone number, comments (which are only displayed while in the phonebook), the associated script and configuration files, baud rate and whether the call is to be data or voice. This allows you to use *Diga!* as an Auto-




DoubleTalk allows two *Diga!* users to send files in both directions while chatting back and forth during the transfers.

dialer. I have created two separate phonebooks, one for BBS's and one for friends. Once an entry is saved, it is simple to select it. All you do is click on the appropriate letter, and the first entry under that letter appears. Then just move the slider to find a particular entry. Once found, you simply click on the Dial gadget and wait until you connect or your script file finishes. From within the phonebook you may also print the current entry or your entire phonebook.

One especially nice feature is the ability for each entry in a phonebook to have its own script file and default configuration. Therefore, you can save your settings of baud rate, parity, transfer protocol, screen colors, etc. and have *Diga!* automatically reload them when you place a call. Also included in the configuration is a set of user-defined Macro keys. You may define any of the ten function keys alone, or in conjunction with the CONTROL, ALT, SHIFT and LEFT-AMIGA keys. This allows you to have 50 possible Macro definitions per configuration.

The one feature that definitely deserves discussion in *Diga!* is DoubleTalk. DoubleTalk allows two *Diga!* users to send files in both directions while chatting back and forth during the transfers. This is accomplished through a packet controlled set of communication protocols. To send a file you select Send from the menu, and then select the file (or files — Batch transfers are allowed!) to send and click on OK. To receive a file (or files) you do nothing, when the sender starts to send the files, all of the appropriate information is sent to you directly and DoubleTalk handles everything. I've been using this feature with some friends in my area, and we are all quite impressed. The transfers are right in there with Xmodem time-wise, yet are as carefree as a Kermit transfer. During a transmission, *both* sides of the transfer are fully aware of how the transmission is going. No more wondering how many more blocks are left in a file. Also, in this mode, there is no need to chop the files due to any sort of file padding.

In addition to its ASCII capture capabilities, *Diga!* also has a variable-sized buffer built in which can be set up for normal or loop capture. Under normal operation, the buffer will record your session until it fills up. At that moment, it will let you know it is full and will stop capturing. In the loop mode, the buffer will start to overwrite earlier data when it fills up. In either mode, you may view the buffer via simple menu-based commands. You may also load an existing text file into this buffer and view it while online.

*Diga!* has full Clipboard support. This means that you may save a buffer to the Clipboard and then transfer it into Notepad or TxEd or vice-versa assuming that you have enough memory to keep both programs in memory.

That is the one thing about *Diga!* that bothers me (and will bother others with 512K machines): *Diga!* is very large. This precludes being able to do any type of multitasking while using it unless you have more than 512K of memory. When I picked up my memory expansion, however, I found *Diga!* quite well-behaved in a multitasking environment. It makes full use of Fast RAM and leaves the bulk of Chip RAM free for other purposes.

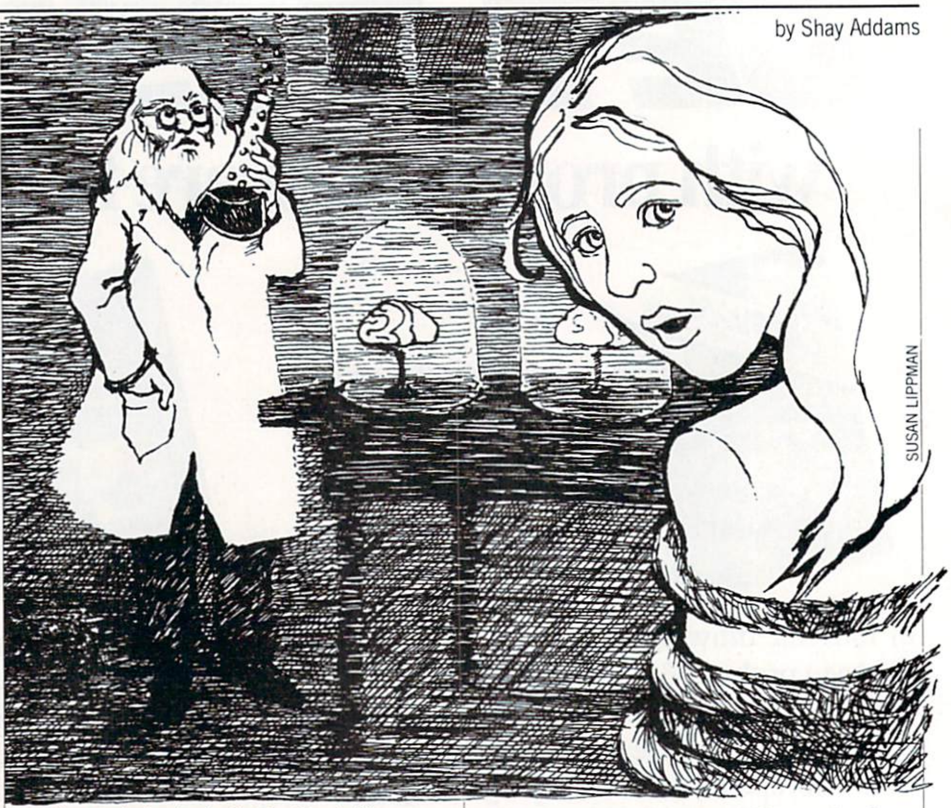
With all the varied telecommunications programs available for the Amiga, one wonders why a company like Aegis would risk producing this type of package. Bill Volk, of Aegis, explains "We saw so many different people creating so many different terminal emulation packages and thought, 'Hey, why not create an emulation construction set?'. We've laid all of the ground work by including the transfer protocols and I/O related code; the user just decides on what type of terminal to emulate. Then, all that is required is to create the emulation file."

Aegis has done a magnificent job in bringing *Diga!* to market. If you are serious about telecommunications and are looking for a product that does what *you* want, then *Diga!* is a best bet.

by Shay Addams

# Animated Adventuring in Maniac Mansion

**News and opinion from a leading explorer of those fantasy realms called adventure games.**




Last year's *Labyrinth* introduced animated, 3D graphics in an adventure for the 64, something usually reserved for Amiga owners who could play the Sierra games like the *King's Quest* series. In every respect but the parser, which was a gimmicky thing called a "wheel," the game was first-rate. Lucasfilm Games' second adventure, *Maniac Mansion* is even better, offering a very convenient interface and some unexpected innovations.

Foremost among them is the three-member team of characters you control in the game, whose goal is to find and rescue a teenaged girl being held by a mad scientist in a spooky old mansion. Instead of just playing the role of one character, you can switch back and forth between three of them. Each has his or her own inventory and may be sent to different rooms at the same time.

This isn't just a gimmick, for some puzzles require coordinated actions by several characters. To open a door, one person must stand before a certain thing and push it. A nearby door opens, but shuts immediately if that person moves. So you've got to have one person open the secret door and another standing by to enter and explore the area beyond.

A new wrinkle in graphics presentation is equally innovative. Instead of viewing a picture of the entire room when you first enter it, you'll see the rest of it scroll into view when a character reaches the side. This makes the house and its 55 rooms feel roomier. You'll find over 450 objects — a microwave oven, a Victrola attached to a cassette recorder, a video arcade — scattered throughout the house. But learn to react quickly, for things happen in real time, and you'll wind up locked in the dungeon if you don't move quickly when one of the weirdos enters the room and takes you by surprise.

The weirdos include Dr. Fred, Nurse Edna, the Purple Tenacle and other wacked-out refugees from a fright night double feature. Fred is a mad scientist-type plotting to take over the world from a secret lab in the basement. He is under the influence of the "evil meteor," which crashed into the mansion's back yard twenty years ago. Though it sounds gory, *Maniac Mansion* is really a takeoff on horror films. After seeing blood stains on a kitchen wall, you expect the worst when you find a refrigerator door with red liquid oozing from it — but this time it turns out to be ketchup. There's a lot of humor in the dialogue and action too, often presented in the "cut scenes." In these the current scene is replaced by an animated sequence which advances the plot. In one, Dr. Fred paces the floor, muttering "How can I take over the world, when I have to use this cheap equipment?" These are brief, and you can kill one if you've already seen it.

The interface is remarkable. Initially it looks like those seen in Interplay games like *Tass Times in Tonetown*, with fourteen verbs listed in a menu below the picture so you can point and click with a joystick to activate one. But this interface is significantly better. Rather than selecting "look" and clicking on an object in the picture, you select the "what is" verb. Move the cursor over an item, and its name appears behind the phrase "what is," so you can efficiently scan a room's contents by gliding around the screen. Choose "walk to," then use the joystick to position the cursor to a spot you want the active character to move to. Then you just hit the button and he heads for the destination. This is handled even more effectively than in Sierra's animated games, where the character will stop if he runs into a chair or other obstacle—characters in this game will walk around anything in the path.

"Walk to" is set up as a default option, so after executing most actions, such as "open door," you don't have to move to the menu to "walk to" the door, for that command is automatically selected. You won't even need to "walk to" an object to "pick up" or "open" or "turn it on." The character is smart enough to know he must first walk over to the object. The parser also lets you use prepositions and direct objects. Click on "give" and choose an item in a character's inventory, and the item's name and the word "to" are displayed. Then you choose a character as the direct object, whose name appears and completes the command. Next you can jab the button to execute the command, or change your selections. A "new kid" verb lets you switch to another character, or you can just press an option key.

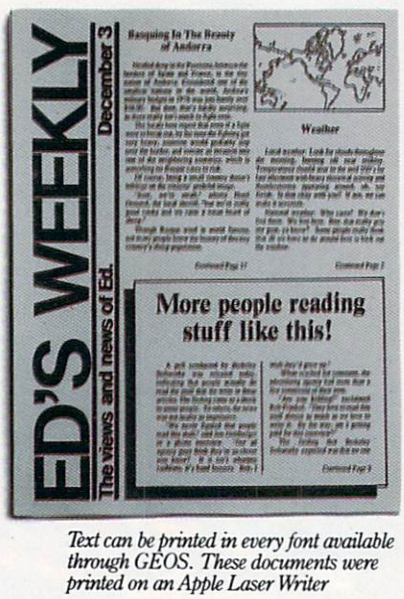
There's also some upbeat music and lots of sound effects, plus a few interesting visual effects. Shine a flashlight in a dark room, and it lights up a single square of the room instead of the entire location.

*Continued on pg. 110*


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*Text can be printed in every font available through GEOS. These documents were printed on an Apple Laser Writer*

# VANISHING TIMES

A Berkeley Softworks Publication — Vol. XLMIV Number 4567

## EARTH TO BEGIN SPINNING IN OPPOSITE DIRECTION



A shocked consortium of scientists confirmed the world's worst suspicions Tuesday, when they announced that the Earth was indeed slowing down. They expect the planet to grind to a halt early Thursday, reversing its direction and getting back up to speed by Monday night.

Although the research was startling, the scientists urged people not to panic.

"I suppose I'd lock all the breakables in your cabinets," offers Dr. Lee Llevano, "but outside of that, I'd just tell people to hold on and enjoy the ride."

Apparently we're in for quite a ride. Dr. Dennis Rowland demonstrated the effect of the sudden reversal by dropping a raw egg into a MixMaster blender set on "puree."

"If we assume people have the consistency of this egg," Rowland asserted, "I think it's safe to say that the effect of this phenomenon will leave them in a state somewhat similar to finely ground beef."

Asked if there were anything the public could do to prepare for the

**"I'd just tell people to hold on and enjoy the ride!"**

catastrophe, Dr. Rowland thought a while and offered, "I always recommend fastening your seat belt. It just makes so much sense, don't you think?"

Analyst Staci Glovsky was less distressed with the news, asking "What's the big deal? Jeez, you guys are acting like a bunch of

Continued Page 8

## MAN BITES POODLE!



BERKELEY — Dozens of citizens watched in horror today as a man, who described himself as an animal lover, actually bit a miniature teacup poodle.

Donald Anderson, of Studio City, California, dismissed the incident as a case of mistaken identity. "Somebody asked me if I wanted a dog with mustard, and since it was close to lunchtime anyway, I just took a bite without looking."

The dog, responding to the name "Knockwurst," then gave out a yelp that bystanders recalled as sounding like "a cross between a gun shot and

**"Sure it was my mustard, but that doesn't prove a thing!"**

an air raid siren." In the process, the pinched pooch set a world record in the long jump of thirty feet, two inches.

Anderson was booked on felony charges of dog munching, poodle endangerment and assaulting a canine with intent to commit relish. He was later released on his own recognizance. The man who offered him the poodle has also been charged with attempting to apply mustard to a mutt, a misdemeanor in Alameda County.

"It's a smear tactic," yelled Rob Siegel, the man still being sought by police. "Sure it was my mustard, but that doesn't prove a thing. Besides, they have to prove with

Continued Page 4

### Television Highlights

This week, you can expect to find some of the best programs right on your own TV set at home. Following are some of the highlights:

Monday:
**(4) 6:30 I LOVE LUCY**
Lucy and Ethel hatch a plot to get Lucy into Ricky's show at the club. (R)
**(7) 8:30 WILD KINGDOM**
Marlon sits in a studio safe and sound, while Jim risks his life for some unimportant animal.

Tuesday:
**(2) 7:30 LAWRENCE WELK IN BULGARIA**
The famed band leader takes you thru 60 minutes of musical merriment, all the time wondering why he is in Bulgaria.
**(5) 9:30 BRUCE LEE IN REVENGE OF THE MEATBALL**
Epic hero Bruce Lee punches his way through pasta, and rescues a pizza from 600 Neopolitan Ninjas.

Wednesday:
**(11) 6:30 I Love Lucy**
Lucy and Ethel hatch a plot to get Lucy into Ricky's show at the club. (R)
**(4) 8:30 Gilligan's Island**
Gilligan and the Skipper finally wise up and figure out that Ginger and Mary Anne must be getting awfully lonely right about now, and go for (Continued Page 4)

### Weather

Local weather: Look for clouds throughout the morning, burning off near midday. Temperatures should soar to the mid 200's by late afternoon with heavy electrical activity and thunderstorms appearing around, oh, say

Continued Page 2

# T MADE GE NEWS.

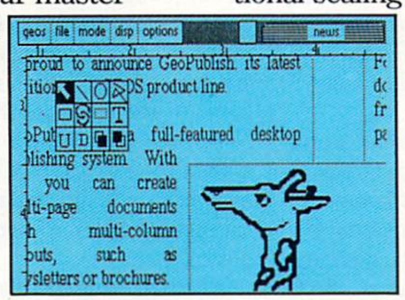
These days, the biggest story in the news is geoPublish. The page-making program for GEOS-equipped 64's and 128's that replaces lifeless layouts with page after page of powerful, punchy professionalism.

**Freedom of the press.**

Actually, geoPublish is very patriotic software. After all, what other application guarantees your freedom of self-expression? Well, geoPublish sure does. In fact, every piece it prints is dedicated to the preservation of your personality on paper.

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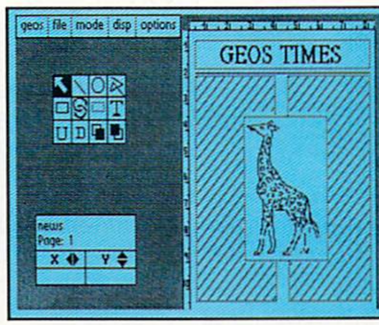
All you do is draw a bunch of columns for your master layout. They could be two, four or sixteen across the page. They could be short and squat, or long and skinny. It's your call. After that, you just "pour" your geoWrite document, text, graphics and all—into column after column. Page after page.




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by Robert W. Baker

# Inside Q-Link

**Explore the inner workings of the Q-Link telecommunication service with network pro Bob Baker.**




LINDA CLARK

There always seem to be new computers and peripherals around the neighborhood during the holidays. Many of the new systems and add-ons are purchased as presents for the "whole family" or for one person in particular. Whatever the case, the influx of new users and old timers getting modems for Christmas is bound to produce additional Q-Link subscribers.

Since almost everywhere you go on Q-Link involves reading or posting messages in various message boards, I thought it might be worthwhile to go over the various features of the editor used to create and enter messages. Besides, you'd be surprised at the number of current Q-Link users who don't really know all the features available with the message editor. Many people only use the very basic functions to enter and edit their messages. So this may be of help to those who want to save time and use some of the more advanced editor capabilities as well.

Once you've decided to enter a new message or add a comment to an existing message, the first thing requested by the system is the message topic. I've mentioned in previous columns how important a relevant heading line is, especially with the searching capabilities in the message boards. Be sure to enter something that lets others know what your message is about instead of something cryptic like "READ ME" or "FOR SALE."

After the heading line is entered, the system clears your screen and displays the starting heading line for your message. At this point you're automatically in the insert mode of the editor and you can simply type the text of the message as desired. If you make a mistake, you can easily use the cursor keys to move around and insert or delete characters as needed.

To insert text, when you're in Insert Mode, simply cursor to the correct position and type. Characters are entered as the text that follows is automatically moved down. To delete text, position one character past the last character to be deleted and press the DEL key. All following text will be automatically moved up as the characters are deleted. In all cases, full words are moved from line to line by the automatic word wrap features of the message editor.

For quick movement to the top of the text, use the CLR/HOME key while holding the SHIFT key. To get back to the end of the text, simply hit the CLR/HOME key alone. If you need to get to the end of any line, position to the line below it and then use the cursor-left key to move the cursor to the end of the previous line using the line wrap features of the editor.

In the simplest case, you enter the entire text of your message, while making small changes as needed, and then press F7 when done. A new menu is displayed, with the first entry being the "Send Message" line. If you press F1, the message you entered is transmitted to Q-Link and the editing session is terminated. However, there are other options available on this menu if you need these other functions.

The second function in the editor menu is the Delete Line entry. This command lets you delete the entire line wherever the cursor was located before pressing F7 to activate the editor menu. The position of the cursor within the line has no effect, the entire line is always deleted. Just be sure the cursor is located on the correct line before pressing F7 and using this command.

If you need to delete only part of a line, then you have two choices. Either use the DEL key to delete individual characters one at a time or use the Delete To End Of Line function in the edit menu. This function will delete all the characters from the current position of the cursor to the end of that line. Any text following that line will be moved up and concatenated to the remainder of the existing line.

If you want to delete a portion of the middle of a line, you could position to the end of the text to be deleted and hit the RETURN key. This will move the remainder of that line to a new line. Then reposition to the start of the text to be deleted and use the Delete to End of Line function to delete the text. If the remaining text is not all on one line, position to the start of the second line and press the DEL key to delete the RETURN character and get everything back on one line.

Another way to delete a part of a line, an entire line, or even multiple lines is by using the Put Mark function from the edit menu. When you activate this function, you return to the text, but only the cursor keys are active besides the function keys. Now when you press the cursor keys, portions of the text are highlighted as you move. The only limitation is that you cannot highlight or mark more than nine lines of text.

When marking text you can move the cursor up and down, left or right, highlighting text as you move away from the original starting point. If you move the cursor back toward the starting point, you'll notice that the text will be un-highlighted and return to normal. This lets

*Continued on pg. 112*



The time: 1400 hours. Somewhere in the Pacific. Some ill-fated coordinates in World War II.
Damage Control reports a hit on the starboard side. Send in Alpha, Baker and Charlie to repair.
eyeball to eyeball action. This time around you'll be right in the middle of it all. You knew it wouldn't be pretty. But how tough could it be to rescue a downed pilot?
Will it be the twin 40mm Bofors anti-aircraft guns? Or the 5" lead-spewers aft? Depth charges or torpedoes? Autopilot or guts?
LIFE, LIBERTY AND THE HAPPINESS OF PURSUIT.
Radar spots inbound Zeroes. Ready forward gunnery positions. Man the anti-aircraft turrets. They're coming.
You're at the helm, commanding the greatest concentration of firepower ever put in a lightweight fighter. The deadly Fletcher Class Destroyer.
You've embarked on the first simulation that actually combines the intricate, large-scale strategy of wargaming with the intensity of furious,
It sure seemed a lot easier than shelling islands, escorting a convoy or hunting subs.
Or so you thought. But now look what you've got. Thirteen fully-operational, ear-bursting battle stations to worry about, all armed to the gills. Not to mention radar. Navigation. Sonar.
And half the Japanese fleet crawling up your spine.
Time to make some tactical decisions.
YOU'VE ALWAYS DREAMED OF BEAUTIFUL MODELS. Now you can pick up an entire assault fleet, including a replica Fletcher Class Destroyer, from Revell. Or win an authentic scrambled eggs flight deck cap. Sweepstakes details are in every box, or write for an entry coupon. No purchase necessary. Sweepstakes ends June 15, 1987. Official rules are available at participating dealers.
Any choice could be your last, so make it good.
Suddenly, you hear the ominous rumble of incoming Zeroes. You fire, and send one plummeting to the sea, trailing a plume of smoke.
On instinct, you instruct the bridge to commence evasive maneuvers.
Even though, by experience, you know there's nowhere to run.
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537

by Buck Childress

# Auto-Con

## *For the Commodore 64*

Whether you program in BASIC or machine language, hex, decimal, binary, and ASCII conversions are a fact of life. Without some type of converter, your patience will certainly be put to the test. Don't overheat. Keep cool with Auto-Con. Just tell it what to convert and Auto-Con does the rest.

After saving a copy of Auto-Con, run it. The loader pokes the machine language data into memory and checks for errors. Now you can load, save and work on anything you want.

When you need a conversion, type SYS 52000 [RETURN]. Let's say you're going to convert decimal 255. Type a number sign (#) followed by the number [RETURN]. After entering #255 you'll see:

#255
$FF
%11111111

The dollar sign ($) represents hex and the percent sign (%) represents binary.

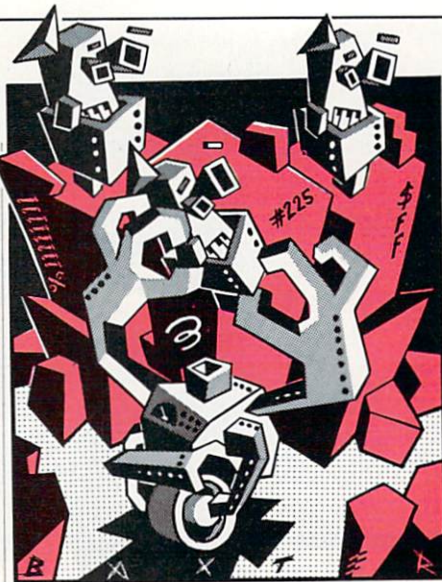
To make a hex conversion, type a dollar sign followed by the hex number [RETURN]. If you enter $1C you'll see:

#28
$1C
%00011100

For binary conversions, precede the number with a percent sign [RETURN]. If you enter %10111 you'll see:

#23
$17
%00010111

When Auto-Con prints a binary number over 255, the high byte appears in reverse video.




ART BAXTER

Auto-Con sits in the background and makes binary, hex, decimal and ASCII conversions whenever you need them.

For ASCII conversions, type a quotation mark (") before the character you want converted [RETURN]. If you enter "A you'll see:

#65
$41
%01000001

Auto-Con will give ASCII conversions for cursor, function, and other normally nonprinting keys as well.

When making hex, decimal, and binary conversions, it's not necessary to type leading zeros. For example, if you want to convert hex ten, you don't have to type $000A (although you can if you wish). Just type $A.

Auto-Con will convert any number up to and including decimal 65535 ($FFFF hex and %1111111111111111 binary). Auto-Con checks your number as it's entered. In decimal conversions you can enter up to five digits using any of the number keys. If you enter a number higher than 65535, Auto-Con prints a question mark (?) and starts over. Up to four digits are allowed in a hex conversion. These can include any number key and the letter keys A through F. Since you can only enter a maximum of four digits, you can't exceed 65535. Binary allows a maximum of 16 digits, which also keeps you from exceeding 65535. Binary is entered using the number keys zero and one.

If you make a mistake during an entry, press the DELETE key. Press the STOP key to exit Auto-Con.

Auto-Con is completely relocatable. The variable S in line 40 of the BASIC loader is the default loading address. It's also the default SYS address. If you want to relocate Auto-Con, just change S before running the loader. The program is 492 bytes long, so be sure you have enough room in your new location. Once the ML data has been loaded, the SYS address is given. ■

Before typing this program, read "How to Enter Programs" and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30007, Shreveport, LA 71130-0007, 1-800-831-2694.

**Auto-Con**

```
30 PRINT CHR$(147)"LOADING AND
   CHECKING DATA LINE:"'CFMJ
40 S=52000:J=S:REM *** CHANGE S TO
   RELOCATE ***'DICK
50 FOR B=0 TO 11:READ A'EGWE
60 IF B=0 THEN L=PEEK(64)*256+PEEK(63)
   :PRINT CHR$(19)TAB(31)L:PRINT'MYCO
70 IF A<0 OR A>255 THEN 90'FICH
80 POKE J+B,A:X=X+A:D=D+1:NEXT B
   :READ A:IF A=X THEN 100'LWMQ
90 PRINT"ERROR IN DATA LINE:"L
   :END'CCVL
100 X=0:J=J+12:IF D<492 THEN 50'GOUC
110 PRINT"THE DATA IS OK AND
    LOADED...":PRINT'CBOE
120 PRINT"SYS"S"TO MAKE
    CONVERSIONS...":END'CCJF
130 DATA 169,13,32,210,255,32,210,255,
    169,0,162,133,1640'BWMH
140 DATA 160,4,133,97,133,253,134,139,
    132,2,132,252,1571'BWSI
150 DATA 153,139,0,136,208,250,160,32,
    153,0,2,136,1369'BUOJ
160 DATA 16,250,169,1,208,43,201,34,
    208,8,162,1,1301'BSOJ
170 DATA 134,2,208,28,240,210,201,35,
    208,4,230,2,1502'BTAK
180 DATA 208,18,201,36,240,14,201,37,
    208,224,162,16,1565'BWPM
190 DATA 160,130,134,2,134,252,132,
    139,32,210,255,169,1749'BYTN
200 DATA 0,133,251,169,175,32,210,255,
    198,211,32,225,1891'BXBF
210 DATA 255,208,5,169,32,76,210,255,
    32,228,255,240,1965'BWQG
220 DATA 251,166,251,208,185,164,253,
```

*Continued on pg. 127*



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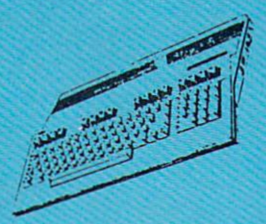
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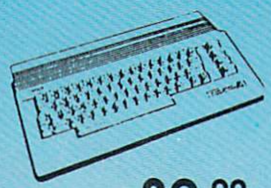
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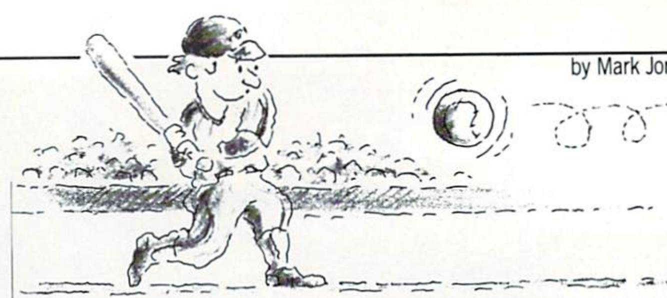
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by Mark Jordan


BOB CLARK

# The 128 Mode

## *Big League Baseball, Part 3*

**Explore the Commodore 128 in its powerful native mode. Some of the articles in this column may be technical, some not so technical—but we guarantee that they will spark your creativity.**

This month we will complete Big League Baseball, a statistical baseball game where you are the manager. If you haven't typed in the first two installments, you will need to do so. Then you must type in the listing included here. Or you can simply purchase the Loadstar disk that contains the entire program.

A few reminders about typing it in: You must first load your previously-saved version; then you can start typing installment #3. Your new typing will re-edit some old lines as well as add many new ones. Once done, save it (use a different name so that your previous version remains intact . . . just in case.)

One last point: the file structure for teams has been changed. If you have already typed in any teams, you'll need to type in listing #2 (entitled "FILE CONVERTER"). Insert the disk on which you have saved your team files and it will correct them.

Last month's embellishments were chiefly graphics; this time we will add statistical capabilities. Now the computer will keep track of your ongoing leagues, sort players' batting and pitching stats, and keep track of standings. With these statistical enhancements, Big League Baseball becomes a complete baseball simulation.

### What's New

Two new options are now listed on the opening menu. They include the ability to view the standings (press D) and to view team statistics (press S). You can do either of these before or after any game. Both options, once loaded from disk and sorted, allow you to print your statistics on paper. Both are also completely self-explanatory. An example of each can be seen in tables 1 and 2.

Once you begin playing, you'll notice a slight change in the information on the screen above the playing field. Instead of the three keyboard choices in the last installment (C for *change pitchers*, S for *statistics*, and W for *walk batter*), there are now four. The change pitcher and walk batter options are still the same but the statistics option has now been subdivided into two categories: B for *batter's statistics* and P for *pitcher's statistics*.

When you press either B or P you will see the batter's or pitcher's stats displayed in the upper left window. Keep in mind that Big League Baseball carries two types of statistics, the permanent ones you typed in and the ongoing stats that are updated each game. To keep straight which is which, current stats are printed in blue and permanent stats in pink. Repeated presses of the B or P key toggle these two sets of stats.

### Playing the Percentages

This ability to compare current stats with permanent ones should help you to make managerial decisions. Let's say, for example, you've got a .200 hitter (real-life, permanent stats) at the plate. You check his current stats and find he's batting .444. You can assume he's more apt to make an out than normal simply because the law of averages is against him. In other words, he's not even a .200 hitter at this point. Over the course of a 162-game season, players' current stats should virtually match their permanent stats.

So what do you do? Well, you could pinch-hit for him. Or take pitches, hoping for a walk. Or bunt runners up if there are any on base. Or just let him hit away, figuring that, on the immediate level anyway, he's still a .200 hitter. (Laws of probability are strange, if you flip a coin heads 19 straight times, the next flip has a 50/50 chance of being heads. Still, I'd bet on tails in that situation.)

At the conclusion of each game you'll be given the option of including the game just played in the official statistics. When you're just experimenting with Big League Baseball, it's a good idea to play some practice games. Just press N (for No) at the "Update records" prompt. However, it is absolutely unethical to use this option as a way to avoid racking up losses for your favorite team. As I've said in previous columns, the choice to cheat is yours . . . and may your conscience keep you awake nights if you decide to do so.

Enough moralizing. You now have all the information you need to set up your own Big League Baseball league. Now for some inside info.

### How Big League Baseball Simulates Reality

You may be wondering just how Big League Baseball is able to reproduce players that statistically match real-life, both pitchers' and hitters' stats. It is no great feat of logic to realize that, with a random number generator, one can merely grab a random number (from 0 to .999) each at-bat, compare it to the hitter's batting average, and if the random number is equal to or less than the hitter's batting average, he gets a hit. Once a hit has been determined, it is a simple matter to determine the type of hit (single, double, triple, home run) based on a breakdown of the hitter's real-life hits.

Line 2400 gets the random number { r1 = rnd(1) } and line 2430 checks to see if the number is higher than the hitter's average (X equals hitter's average). If it is then the batter has *not* made a hit. (The BEGIN/BEND loop that follows determines if a walk, error, etc. has occurred.) If R1 is less than the batter's average, a hit has happened. We drop down to line 2500 and begin to determine what type of hit it will be.

The above is very simple — the trick is to allow the pitcher's stats to influence the game also. If the hitter's statistics alone are used to determine the outcome of each pitch, all pitchers would be generic.

The solution is equally simple. The program uses hitter's stats only half the time. The other times the pitcher's statistics will be used. Of course, we don't want to simply alternate hitter-pitcher stats — that could create lopsided results. Instead each pitch we need to randomly decide whether the pitcher's or hitter's stats take precedence. Line 2400 and line 2410 do this. If R2 is greater than .5 (which it will be half the time), then we simply make

*Continued on pg. 60*

# TAKE YOUR REVENGE!



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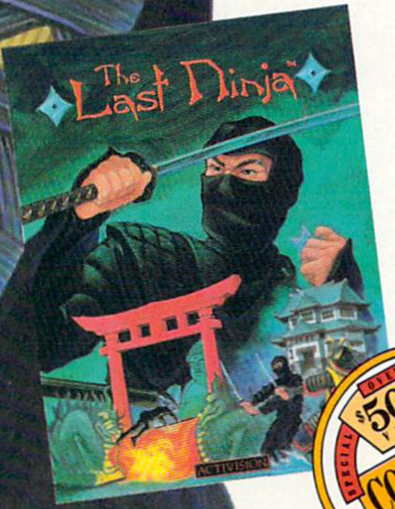
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*Continued from pg. 58*

X equal the "pitcher's average." Thus half the time X equals the hitter's average, half the time it equals the pitcher's.

Does it work? You bet. If you run a 40+ game season, you'll find the hitter's and pitcher's ongoing statistics becoming closer and closer to the actual statistics you typed in when you entered the team files. Of course, the longer the season, the more accurate your results will become.

Pitcher's ERAs were a little tougher to make come out than hitter's stats. It would have taken too much code to determine which runs were earned and which were not. I did a little experiment which solved this problem: I simply tallied the *total* runs scored in the Major League in 1986 then the *earned* runs and analyzed what percentage were unearned. My findings were that each pitcher's ERA is .5 runs lower than their "TRA" (total runs allowed average).

Some refinements that could be added to make the game even more realistic just weren't possible in a BASIC program this size. For one thing, it would have required more IF/THEN statements which would have slowed things down too much. For another, the editors of this magazine have space considerations. And finally, you aren't likely to enjoy another three hours of typing and proofreading. But now that you have it all typed in, there's no reason you can't spend time examining the listing (table 3 will help) and making some adjustments of your own.

Big League Baseball was a big league programming effort for me. I hope you get many hours of enjoyment designing and managing your own league. ■

**Table 1: Printout of Standings**

| AL East | W | L | Pct | AL West | W | L | Pct |
|---|---|---|---|---|---|---|---|
| Bluejays | 15 | 5 | .750 | Twins | 16 | 5 | .761 |
| Tigers | 13 | 6 | .684 | Royals | 15 | 7 | .681 |
| Redsox | 13 | 8 | .619 | Whitesox | 10 | 9 | .526 |
| Brewers | 11 | 9 | .550 | Mariners | 11 | 10 | .523 |
| Indians | 9 | 9 | .500 | Athletics | 9 | 11 | .450 |
| Orioles | 7 | 14 | .333 | Angels | 7 | 12 | .368 |
| Yankees | 5 | 14 | .294 | Rangers | 5 | 15 | .250 |

**Table 2: Printout of Player Stats**

| Player | AB | H | BB | HR | Ave |
|---|---|---|---|---|---|
| Mitchell | 1 | 1 | 0 | 0 | **** |
| Strawberry | 15 | 8 | 5 | 0 | .533 |
| Santana | 20 | 6 | 1 | 0 | .300 |
| Knight | 17 | 4 | 4 | 0 | .235 |
| Carter | 22 | 5 | 1 | 0 | .227 |
| Dykstra | 18 | 4 | 2 | 0 | .222 |
| Hernandez | 19 | 4 | 3 | 0 | .211 |
| Backman | 21 | 4 | 2 | 0 | .190 |
| Wilson | 17 | 1 | 3 | 0 | .059 |
| Teufel | 0 | 0 | 0 | 0 | .000 |

| Player | IP | H | SO | BB | ERA |
|---|---|---|---|---|---|
| Orosco | 0 | 0 | 0 | 0 | 0.00 |
| Ojeda | 4 | 1 | 0 | 0 | 0.00 |
| Fernandez | 11 | 6 | 0 | 1 | 0.00 |
| Darling | 13 | 12 | 0 | 1 | 2.08 |
| Gooden | 18 | 22 | 7 | 2 | 3.00 |

**Table 3: Program Outline**

Lines 1 - 66: variables setup
Lines 70 - 140: draw playfield
Lines 150 - 388: more setup
Lines 400 - 440: main program loop
Lines 460 - 560: prepare scoreboard, etc.
Lines 590 - 840: game-play routine
Lines 860 - 1200: set lineup
Lines 1230 - 1480: pick teams
Lines 1510 - 1640: load teams
Lines 1670 - 2000: save teams
Lines 2030 - 2070: update teams
Lines 2110 - 2228: calculate hitter's and pitcher's stats
Lines 2240 - 2300: print hitter's stats
Lines 2320 - 2336: check keyboard and joystick
Lines 2339 - 2410: pitch and hit
Lines 2430 - 2480: if non-hit, breakdown
Lines 2500 - 2540: if hit, breakdown
Lines 2560 - 2610: complete hitter's at-bat
Lines 2630 - 2970: move runners up, tally runs, etc.
Lines 3000 - 3097: change lineup (pinchhitters)
Lines 3100 - 3170: bunts routine
Lines 3200 - 3270: steals routine
Lines 3300 - 3430: change pitchers
Lines 3500 - 3544: walks routine
Lines 3600 - 3670: determine keypress (W, C, B, P)
Lines 3700 - 3790: sort standings
Lines 3800 - 3870: save game results and standings
Lines 3900 - 3996: sort player stats
Line 4000 : play tune
Lines 4100 - 4140: update pitcher's stats
Lines 4200 - 4265: print player stats

Before typing this program, read "How to Enter Programs" and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30007, Shreveport, LA 71130-0007, 1-800-831-2694.

**Big League Ball**

```
1 AA=Ø:AV=Ø:B=Ø:B1=Ø:B2=Ø:BA=Ø:BI=Ø
  :C=Ø:C1=Ø:C2=Ø:CC=Ø:CH=Ø:CI=Ø:D=Ø
  :DD=Ø:DK=Ø'QKYX
2 DV=Ø:FL=Ø:GM=Ø:GR=Ø:GV=Ø:H=Ø:H1=Ø
  :H2=Ø:HH=Ø:IN=Ø:J=Ø:J2=Ø:JH=Ø:JI=Ø
  :JS=Ø:JZ=Ø:K=Ø:KK=Ø:L=Ø:ME=Ø:MO=Ø
  :NN=Ø:NP=Ø:OU=Ø'YQJO
3 P=Ø:P2=Ø:PA=Ø:PH=Ø:PK=Ø:PL=Ø:PO=Ø
  :R=Ø:R2=Ø:R3=Ø:RE=Ø:S=Ø:SB=Ø:SL=Ø
  :SP=Ø:SS=Ø:SX=Ø:T1=Ø:TB=Ø:TR=Ø:UD=Ø
  :UL=Ø:US=Ø:UY=Ø'YRTP
4 W=Ø:WB=Ø:WH=Ø:WK=Ø:WP=Ø:X=Ø:XX=Ø:Y=Ø
  :Y1=Ø:Y2=Ø:Z=Ø'LOLT
5 A$="":AB$="":AV$="":B$="":BA$=""
  :C$="":CU$="":F$="":HR$="":L$=""
  :P$="":PO$="":S$="":SC$="":T$=""
  :W$="":WK$="":X$=""'SLME
232 DIM N(4),SX(4),SY(4),D$(4),KO$(1,
    25,6),KO(1,25,6),IP(1),HP(1),
    RP(1),DV(1),SP(25),SE(25),SB(25),
    SC(25),Q$(6),BS$(1,25),EA(25),
    EB(25)'BCSC
234 N(1)=6:N(2)=6:N(3)=7:N(4)=7
    :CI=11'FDLM
235 SX(1)=Ø:SX(2)=2Ø:SX(3)=Ø:SX(4)=2Ø
    :SY(1)=Ø:SY(2)=Ø:SY(3)=11
    :SY(4)=11'IJEW
236 A$="[SPACE2,SHFT W,SPACE3,SHFT L,
    SPACE3,SHFT P]CT":D$(1)="-[SHFT N,
    SHFT L] [SHFT E]AST"+A$
    :D$(2)="-[SHFT N,SHFT L] [SHFT W]
    EST"+A$:D$(3)="-[SHFT A,SHFT L]
    [SHFT E]AST"+A$:D$(4)="-[SHFT A,
    SHFT L] [SHFT W]EST"+A$'JJLL
270 DATA "[SPACE2,SHFT S]ELECT[SPACE2]
    ","[SHFT P]=PLAY[SPACE4]","
    [SHFT C]=CREATE[SPACE2]","[SHFT U]
```

*Continued on pg. 62*

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```
    =UPDATE[SPACE2]","[SHFT D]
    =STNDINGS","[SHFT S]=STATS[SPACE3]
    ","[SHFT Q]=QUIT[SPACE4]",,,,
    "PCUDSQ"'BKLD
378 T$="V1T4":W$="V2T4"
    :SO$(0)=T$+W$+LEFT$(C$,126)
    :SO$(1)=LEFT$(C$,90)
    :SO$(2)=MID$(C$,127)
    :SO$(3)=T$+W$+LEFT$(C$,63)'OVGN
420 ON A GOSUB 590,1670,2030,3700,
    3900,440'CDDG
480 FOR T=1 TO 6:CHAR 1,1,T+1,
    LC$+M$(ME,T),1:NEXT'HALQ
485 IF AA=0 THEN AA=1:GOSUB 4100'FLJQ
504 COLOR 1,5:CHAR 1,13,0,LC$+"
    [SHFT B]=[SHFT B].STATS[SPACE2,
    SHFT W]=WALK[SPACE2,SHFT C]
    =CHANGE":CHAR 1,13,1,LC$+"[SHFT P]
    =[SHFT P].STATS"'FAEY
592 COLOR 1,15:CHAR 1,22,22,"[SPACE10]
    ",1'CPVP
594 CHAR 1,22,23,"[SPACE10]",1'BKAP
832 IN=IN-1:GOSUB 3800'DKCL
1040 IF HO$(H,T,1)="[SHFT P]
     "THEN P(H)=T:FOR A=2 TO 6
     :PP(H,A)=KO(H,T,A):NEXT'JMDM
1262 DV(H)=D:H(H)=C'CMGH
1605 IF S>1 THEN INPUT#2,T$
     :KO$(H,T,S)=T$:KO(H,T,
     S)=VAL(T$)'HINQ
1612 KO$(H,T,0)=HO$(H,T,0)
     :KO$(H,T,1)=HO$(H,T,1)'CQBM
1692 H=0'BCQL
1950 FOR T=1 TO NP:PRINT#2,HO$(H,T,
     0)'ERON
1960 PRINT"..."HO$(H,T,0)'BKKL
1962 PRINT#2,HO$(H,T,1)'BMNN
1970 FOR S=2 TO 6:PRINT#2,HO$(H,T,S)
     :PRINT#2,STR$(KO(H,T,S))
     :NEXT'HGVU
2124 JZ=0'BDIC
2222 IF KO(H,P2,2)=0 THEN 2228'DPHF
2224 BA$=LEFT$(STR$(KO(H,P2,3)/KO(H,
     P2,2))+"000",5):AB$=MID$(STR$(KO
     (H,P2,2)),2)'IYBS
2226 HR$=MID$(STR$(KO(H,P2,4)),2)
     :PO$=LEFT$(STR$(KO(H,P2,4)/KO(H,
     P2,2))+"000",4):WK$=MID$(STR$(KO
     (H,P2,5)),2)'LTDC
2228 CI=7:RETURN'CEKI
2242 COLOR 1,CI'BEHD
2250 CHAR 1,1,2,LC$+LEFT$("[SHFT A,
     SHFT B]S[SPACE3]"+AB$+"[SPACE4]",
     10),1'FTML
2260 CHAR 1,1,3,LC$+LEFT$("[SHFT A]
     VE "+BA$+"[SPACE6]",10),1'FTVL
2270 CHAR 1,1,4,LC$+LEFT$("[SHFT H,
     SHFT R]S[SPACE3]"+HR$+"[SPACE4]",
     10),1'FTJN
2280 CHAR 1,1,5,LC$+LEFT$("[SHFT P]
     OWER"+PO$+"[SPACE5]",10),1'FTKO
2290 CHAR 1,1,6,LC$+LEFT$("[SHFT W]
     ALKS "+WK$+"[SPACE4]",10),1'FTDP
2295 CHAR 1,1,7,LC$+LEFT$("[SHFT S]
     PEED"+STR$(SB)+"[SPACE4]",10),
     1'GUIU
2297 CI=11'BEJN
2320 S$="":WH=1:DO'DHKD
2322 GET B$:J2=JOY(2):IF B$<>""THEN
     GOSUB 3600:GOTO 2322'JUQK
2470 RE=INT(RND(1)*7)'EIKJ
2574 IF RE+TB=7 THEN PP(HH,5)=PP(HH,
     5)+1'GWQT
2602 KO(H,P2,2)=KO(H,P2,2)+WH'CWUI
2762 IF RE=7 THEN KO(H,P2,3)=KO(H,P2,
     3)+1:IF TB=4 THEN KO(H,P2,
     4)=KO(H,P2,4)+1'KYGB
3255 IF RE=15 THEN WH=0'EHWL
3372 H2=HH:HH=(H+1)AND 1:GOSUB 4100
     :HH=H2'GWOQ
3500 SOUND 1,15000,30,0,14000,200,1
     :SPRITE 4,0'CEJH
3542 WH=0:KO(H,P2,5)=KO(H,P2,5)+1'DADN
3544 PP(HH,4)=PP(HH,4)+1'CRDN
3600 IF B$="W"THEN RE=11:TB=1
     :GOSUB 2560:GOSUB 2110
     :GOSUB 2240'IAXL
3610 IF B$="C"THEN R=INT(RND(1)*5)
     :GF(HH)=(R-2)/8:GOSUB 3300'LBCP
3620 IF B$="B"THEN BEGIN'EDMG
3622 :JZ=(JZ+1)AND 1'DJNJ
3624 :IF JZ=1 THEN GOSUB 2222
     :ELSE GOSUB 2170'GNXN
3626 :BEND:GOTO 2240'CHTL
3630 IF B$="P"THEN BEGIN'EDBH
3634 :JS=(JS+1)AND 1:JH=P(HH)'ERYO
3636 :IF JS=1 THEN JI=7:FOR T=2 TO 6
     :T$(T)=MID$(STR$(KO(1,JH,T)),2)
     :NEXT:ELSE JI=11:FOR T=2 TO 6
     :T$(T)=HO$(1,JH,T):NEXT'SLOK
3640 :COLOR 1,11:CHAR 1,1,1,
     LC$+LEFT$(HO$(HH,JH,0)+SP$,10),
     1'FMBQ
3650 :COLOR 1,JI:FOR T=1 TO 6
     :CHAR 1,1,T+1,LC$+LEFT$(LEFT$
     (IN$(1,T)+" ",5)+" "+T$(T)+SP$,
     10),1:NEXT'OXRB
3700 GM=RGR(0):GRAPHIC 0,1:COLOR 0,15
     :COLOR 4,7'FSKJ
3703 FOR DV=1 TO 4'DENH
3705 DOPEN#2,"STANDINGS"+STR$(DV)'DICN
3707 IF DS>0 THEN DCLEAR:GOSUB 3780
     :GOTO 3717'GOJP
3710 FOR K=1 TO N(DV):INPUT#2,WI(K),
     LO(K):NEXT:DCLOSE'GYXM
3715 GOSUB 3775'BEXJ
3717 IF DV=1 OR DV=3 THEN PRINT"
     [CLEAR,BLACK]"'GGFQ
3718 PRINT"[DOWN2,RVS]",D$(DV)'BHAN
3720 FOR T=1 TO N(DV):W=WI(SE(T))
     :L=LO(SE(T)):P=W/(W+L)'ILSS
3722 W$=LEFT$(STR$(W)+SP$,4)
     :L$=LEFT$(STR$(L)+SPS$,3)
     :P$=LEFT$(STR$(P)+"00",5)'MLXW
3725 DI$(DV,T)=LEFT$(TM$(DV,
     SE(T))+SP$,9)+W$+L$+P$'GKAV
3730 PRINT,DI$(DV,T)'BKYH
3735 NEXT:NEXT'CBLL
```

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*Continued from pg. 62*

```
3745 PRINT"[CLEAR,RVS,BLUE] [SHFT A]
     [BLACK]=[SHFT A]MERICAN [SHFT L]
     EAGUE[SPACE2,BLUE] [SHFT N]
     [BLACK]=[SHFT N]ATIONAL [SHFT L]
     EAGUE"'BAUB
3747 PRINT "[RVS,BLUE] [SHFT P]
     [BLACK]=[SHFT P]RINTER[SPACE10,
     BLUE] [SHFT X] [BLACK]=[SHFT E]
     XIT[SPACE11]"ET$'BDSA
3750 DO:GET KEY A$:IF A$="X"THEN
     EXIT'HGLN
3751 IF A$="P"THEN OPEN 4,4,7:CMD 4
     :FOR DV=1 TO 2:PRINT,D$(DV+2),,
     D$(DV):FOR T=1 TO 7
     :PRINT,DI$(DV+2,T),,DI$(DV,T)
     :NEXT:PRINT:PRINT:NEXT:CLOSE 4
     :GOTO 3762'VTBL
3752 IF A$="A"THEN T1=3'EFTM
3754 IF A$="N"THEN T1=1'EFAP
3756 PRINT"[CLEAR]"'BATO
3760 FOR DV=T1 TO DV+1:PRINT"[DOWN2,
     RVS]",D$(DV):FOR T=1 TO N(DV)
     :PRINT,DI$(DV,T):NEXT:NEXT'LLHX
3762 LOOP'BAKK
3765 PRINT"[HOME2]":GRAPHIC GM
     :RETURN'DEAQ
3770 IF RU(0)>RU(1)THEN
     WI(H(0))=WI(H(0))+1
     :LO(H(1))=LO(H(1))+1
     :ELSE WI(H(1))=WI(H(1))+1
     :LO(H(0))=LO(H(0))+1'MGUJ
3775 FOR T=1 TO N(DV):SP(T)=WI(T)/(WI
     (T)+LO(T)):SE(T)=T:NEXT'INPD
3777 NN=N(DV)'BHJS
3780 FOR T=NN-1 TO 1 STEP-1
     :FOR I=1 TO T'JKFS
3785 IF SP(SE(I))<SP(SE(I+1))THEN
     T1=SE(I):SE(I)=SE(I+1)
     :SE(I+1)=T1'JWEH
3790 NEXT:NEXT:RETURN'DCGN
3800 GOSUB 4100'BEGE
3803 CHAR 1,0,24,LC$+"[SHFT U]
     PDATE RECORDS?[SPACE2,SHFT Y]/
     [SHFT N]"'CKXQ
3805 GET KEY A$:IF A$="N"THEN
     3818'FJON
3810 IF A$<>"Y"THEN 3805'EGLI
3812 FOR T=1 TO 5:SPRITE T,0:NEXT'FJJL
3815 GRAPHIC 0,1:GOSUB 3820
     :GRAPHIC 1'DKVN
3818 CHAR 1,0,24,"[SPACE20]"
     :RETURN'CIOR
3820 COLOR 0,15:COLOR 4,7
     :COLOR 5,1'DMUK
3823 FOR H=0 TO 1:DV=DV(H)
     :HH=(H+1)AND 1'HTJR
3825 DOPEN#2,"STANDINGS"+STR$(DV)'DICQ
3827 FOR T=1 TO N(DV):INPUT#2,WI(T)
     :INPUT#2,LO(T):NEXT'GYOV
3828 DCLOSE'BBNO
3830 IF RU(H)>RU(HH)THEN
     WI(H(H))=WI(H(H))+1
     :ELSE LO(H(H))=LO(H(H))+1'IVSW
3834 SCRATCH"STANDINGS"+STR$(DV)'DEEP
3835 DOPEN#2,"STANDINGS"+STR$(DV),
     W'DKCS
3840 FOR T=1 TO N(DV):PRINT#2,WI(T)
     :PRINT#2,LO(T):NEXT'GYDQ
3845 DCLOSE'BBNN
3855 GOSUB 4100:F$=H$(H):NP=NP(H)
     :GOSUB 1920'EABV
3860 NEXT'BAEJ
3870 RETURN'BAQK
3900 GM=RGR(0):H=0:HH=0
     :V$(H)=" [L. BLUE] TEAM[SPACE6]
     "'FSDO
3905 GOSUB 1240:H=0:GOSUB 1510
     :NN=NP(H)'EUFQ
3910 FAST:B=0:C=0:FOR T=1 TO NN'GMSM
3912 IF HO$(H,T,1)="[SHFT P]
     "THEN SP(T)=0:C=C+1:SC(C)=T
     :GOTO 3922'IHVU
3913 B=B+1:IF KO(H,T,2)=0 THEN SP(B)=0
     :GOTO 3920'HAZS
3915 SP(B)=KO(H,T,3)/KO(H,T,2)'CXIQ
3920 SE(B)=T'BGXI
3922 NEXT'BAEI
3925 GOSUB 3780'BETM
3927 FOR T=1 TO B:SB(T)=SE(T)
     :NEXT'FPNT
3930 NN=C'BDTI
3935 FOR T=1 TO C:IF KO(H,SC(T),
     2)=0 THEN SP(SC(T))=0
     :GOTO 3950'IIMY
3945 SP(SC(T))=(KO(H,SC(T),
     3)/3)/(KO(H,SC(T),2)/9)'EQFY
3950 SE(T)=SC(T):NEXT'CLEM
3955 GOSUB 3780'BETP
3960 COLOR 4,7:COLOR 0,15
     :COLOR 5,1'DMUP
3970 FOR T=1 TO B:P2=SB(T)
     :GOSUB 3992'FQCR
3972 IF KO(H,P2,2)=0 THEN EB(T)=0
     :ELSE EB(T)=KO(H,P2,3)/KO(H,P2,
     2)'HSVC
3976 BS$(0,T)=T$:NEXT'CLJU
3980 FOR T=C TO 1 STEP-1:P2=SE(T)
     :GOSUB 3992'HRIU
3982 IF KO(H,P2,2)=0 THEN EA(T)=0
     :ELSE EA(T)=KO(H,P2,6)/(KO(H,P2,
     2)/9)'IVCE
3986 BS$(1,T)=T$:NEXT'CLKV
3990 GOTO 4200'BEDO
3992 FOR K=2 TO 5:Q$(K)=RIGHT$("
     [SPACE2]"+STR$(KO(H,P2,K))+" ",5)
     :NEXT'JBVB
3994 T$=LEFT$(HO$(H,P2,0)+SP$,
     12)+Q$(2)+Q$(3)+Q$(5)+Q$(4)+"
     [SPACE2]"'IQZG
3996 RETURN'BAQT
4100 FOR T=2 TO 6:KO(H,P(H),T)=PP(H,T)
     :NEXT'FYMF
4110 KO(H,P(H),2)=KO(H,P(H),
     2)+IN-IP(H):IP(H)=IN'EOIJ
4120 KO(H,P(H),3)=KO(H,P(H),
     3)+HI(HH)-HP(H):HP(H)=HI(HH)'EWJM
4130 KO(H,P(H),6)=KO(H,P(H),
     6)+RU(HH)-RP(H):RP(H)=RU(HH)'EWEN
```

*Continued on pg. 136*

The results are tallied! We asked our best reviewers to choose their favorite products of the year in the order of their preference. The result is our third annual collector's edition—The Best Of 1987. This year we've added Amiga divisions in almost every category. Of course there are many other excellent products on the market, but these are the ones that received our reviewer's top recommendations.



# HARDWARE — THE BEST OF 1987

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**64 and 128**
**$949.95**
Runs copy-protected software (with limitations). Supports both 64 and 128 modes. Has disk-access speed more than 65 times faster than the 1541 disk drive in 64 mode and over 100 times faster in 128 mode. Interfaces via the expansion port. Contains its own on-board DOS. Expandable in 20MB increments. Additional daisy chain and multiplexer option allows sixteen 64/128 computers to be connected to one Lt. Kernal system. Two copy utilities included with system.

*Turbo Processor*
**Swisscomp, Inc.**
**64**
**$189.00**
A 4 MHz speed, add-on computer with its own 64K of RAM. Replaces operation of the 64, except for the I/Os. Has two operating systems and space for another. Especially useful for faster processing of home-grown, complex programs. Runs much commercial software at four times the normal 64 speed. Plugs into cartridge port.

*TCM-1200H Hayes-Compatible Modem*
**Trans Com, Inc.**
**64 and 128**
**$179.95**
Powered directly from the computer, eliminating excess power pack. Requires no RS-232 interface. Full Hayes-AT compatibility, plus Bell 212 and CCITT V.22 compatibility. Auto-select 300-1200 baud and originate/answer modes. Features include eight LED status lights, auto-answer disable switch, speaker with level control, two phone jacks, and tone or pulse dialing.

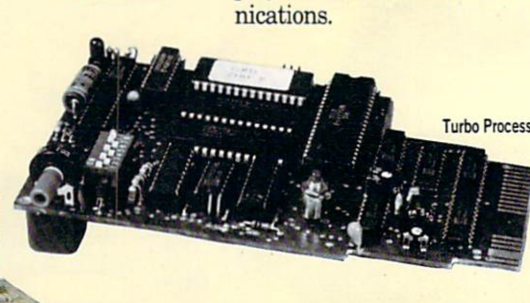
*Command Center*
**Ketek**
**64, 64C and 128**
**$119.95/$129.95/$149.95**
Workstation organizer used to mount disk drive(s), support monitor and provide consolidated wiring system. Features include built-in AC power strip with surge protection, built-in drive cooling fan, easily accessible on/off switches for modem and disk drives.

*1764 RAM Expansion Cartridge*
**Commodore Business Machines, Inc.**
**64**
**$149.95**
Adds 256K RAM when plugged into expansion port. Includes two disks: (1) a DOS program disk enabling use of the extra RAM as a RAM disk and (2) a GEOS disk, enabling use with all GEOS applications.

*The Expert Cartridge*
**Swisscomp, Inc.**
**64**
**$39.95**
A multi-function cartridge that includes the following utilities: allows users to chose their own operating systems, extracts sprites, removes sprite collisions in games, extracts hi-res drawings from programs, converts extracted hi-res program drawings to *Koala* painter files, converts *Doodle* or *Print Shop* files to *Koala* files, automatic back-up to disk, a machine code interrogator, and much more.

*Super Graphix "Gold" Printer Interface*
**Xetec, Inc.**
**64 and 128**
**$119.95**
This year's upgrade to the industry standard that emulates the Commodore 1525 printer. 32K buffer on board. Supports fast serial from the 128, as well as standard serial from the 64. Enables the use of 32 printers, with customizing printer drivers for most others. Eight fonts available. All fonts support underlining, italicizing, boldfacing, super- and subscripts, and nine type pitches.

*AIR-1*
**Microlog Corp.**
**64**
**$199.00**
An all mode communication terminal that enables computer coding of transmit signals, and de-coding of received signals from radio tranceivers. Receives/sends: radio teletype at 60-132 words per minute, 110/300 baud ASCII, Morse code key up to 150 words per minute. Monitors on-screen tuning for radio frequency. Receives to and transmits from disk drive. Split-screen displays receive/transmit communications.

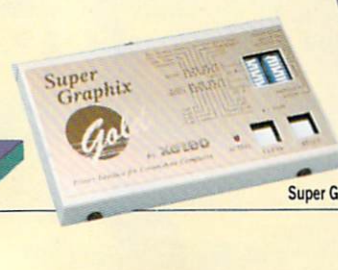

Turbo Processor


Command Center


TCM-1200H


The Expert Cartridge


1764 RAM Expansion Cartridge



Super Graphix "Gold" Printer Interface

# AMIGA

by Tim Jones

*TIC Battery Backed Clock/ Calendar*
**Byte By Byte**
**$59.95**

The TIC is a fantastic little clock/calendar package that is easy to use and doesn't interfere with most programs on the Amiga. The unit is a small black box that plugs into the second game port of the Amiga. To read it, Byte by Byte has included a very simple routine that can be called from inside your Startup-Sequence. TIC is fully buffered and can be removed without fear of upsetting your Amiga (or itself, for that matter).

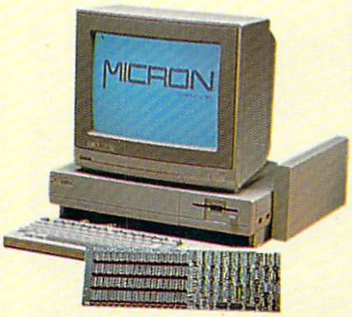
*Amiga 1000/500 68020/ 68881 Piggyback Boards*
**Computer System Associates**
**68020 unit $595**
**68020/68881 unit $895**

Computer System Associates has produced a piggyback unit that will give your Amiga 1000 or 500 a 2000% performance increase over one of the industries defacto standards in performance—the IBM-PC/AT. If you're looking for a cost effective method of increasing the computational power of your Amiga 500 or 1000, this is definitely the way to go.

*Turbo Amiga Highrise*
**Computer System Associates**
**Amiga 1000 Highrise Chassis $995.**
**68020 CPU Board $1,195**
**68020 CPU Board with 14MHz 68881 Coprocessor $1,495**
**512KByte 32 bit SRAM running at 14 MHz $1,295**
**SCSI controller card $695**
**20 MByte SCSI Disk $995**
**2MByte SRAM running at 14 MHz $3,995**

CSA has also developed the Turbo Amiga Highrise unit—an Amiga 2000-compatible expansion chassis for the Amiga 1000. The unit can be purchased bare, or with any of the additional cards listed above. Also, the bus is designed to give Amiga 1000 owners the ability to use Amiga 2000 cards, including the Bridgeboard and AT-compatible cards.

All of the cards listed above are also designed to fit directly into the Amiga 2000 chassis.




Micron 2 Mbyte Memory Expansion

*Micron 2 Mbyte Memory Expansion*
**Micron Technology, Inc.**
**2 MEG DRAM Boards**
**Amiga 1000/500 W/Chassis & interface $550**
**Amiga 2000 $495**

Micron Technology has finally turned their attention to the Amiga family and built a very tough 2 MByte, autoconfiguring (under 1.2), zero wait state RAM card. The card is designed in an Amiga 2000 bus configuration and an external Chassis and interface card are available for use with the 500 and 1000. Included with the units are full diagnostic software and a recoverable RAMdisk driver.

*Amiga 500*
**Commodore Business Machines**
**$699.00**

The Amiga 500 differs from the 1000 in both appearance and internal design. The chip count has been reduced quite a bit which accounts for the reduced price. The unit is an integral machine with the console and keyboard built into the same case (unlike the 1000 and the 2000 where the keyboards are separate). The unit comes with 512K of internal RAM and has an expansion slot built in for the installation of the Amiga 501 expansion RAM/Clock-calendar unit. This allows you to install a full MEG of RAM internally.

If you've been waiting to get on the Amiga train, the Amiga 500 is a way to step aboard without breaking the bank.

*Amiga 2000*
**Commodore Business Machines**
**$1,995.00**

The Amiga 2000 is the next logical step forward in the Amiga family. While the 1000 allowed for expansion, the 2000 has taken this ability and included it within the confines of the machine itself. Now you can place your expansion drives, hard drives, memory expansion, network cards and many other options inside the machine.

The Amiga 2000 also offers three slots for use under the MS-DOS configuration allowed via the installation of a Bridgeboard that adds IBM-PC/XT compatibility to the bag of tricks already included with the machine. The Bridgeboard acts as a separate computer inside of the 2000 and actually runs concurrently with any other tasks functioning on the Amiga side of the bus.

If you are looking for a machine that will offer the most "Bang for the Buck," then the Amiga 2000 is a very good choice.

*Ameristar Network*
**Ameristar Technologies**
**2000 Configuration Ethernet or Arcnet card $495.00**

Ameristar has developed a set of network cards that will allow the Amiga 2000 to go online with major networking systems, like SUN or DEC's VAX mainframes. Ameristar has put together two of the industry's leading network protocols and come up with a very powerful network board for the Amiga 2000. Businesses can now buy an expensive system to act as server and use Amigas as client workstations or simply utilize Amigas to perform the jobs once limited to the more expensive minis and mainframes.



Amiga 2000

Amiga 500

Turbo Amiga 68020 CPU Board




# Adventure/Role-Playing Games

## 64&128

by Shay Addams

***Stationfall***
**Infocom**
**$34.95**
Your assignment is pushing pencils as an office worker, and your first job is to pick up a supply of "request form forms" from a neighboring station. When you arrive, however, there's not a soul on board. Unless you figure out what happened to the crew and take appropriate measures, the same fate is in store for you — and the rest of humanity.

***Lurking Horror***
**Infocom**
**$34.95**
Pays tribute to little-known master of American horror, H.P. Lovecraft. You play a student at G.U.E. Tech trying to complete your term paper due the next day. Instead of the file containing your notes, you retrieve a sinister message which leads you into the building's spooky basement, then up to the top of the dome and back down into even deeper dungeons.

***Maniac Mansion***
**Lucasfilm Games/Activision**
**$34.95**
Your goal is to find and rescue a teenaged girl being held by a mad scientist in a spooky old mansion. Instead of playing the role of one character, you must switch back and forth between three of them.

***Guild of Thieves***
**Firebird**
**$39.95**
A second adventure from the people who brought you *The Pawn*. This adventure is also set in Kerovnia, however this time . . . "You are an aspiring member of the infamous Guild Of Thieves. As a test assignment you have been told to ransack a castle and the surrounding area of all valuables."

***Bureaucracy***
**Infocom**
**$34.95 (128 only)**
Douglas Adams' latest adventure is based on one of real life's frustrating events: his bank lost the change of address form he filled out when he moved, and as a result, his credit cards soon became useless. That's what happens to you in this game.

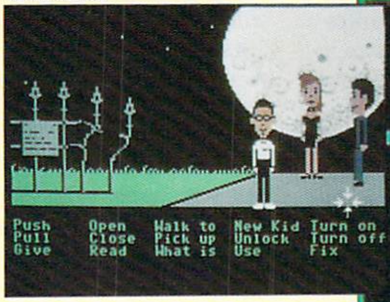
***Pirates!***
**MicroProse**
**$39.95**
You assume the role of a pirate whose goal is to acquire a fortune in booty. Plenty of combat as you fight enemy captains ship-to-ship and ship-to-shore.

***Destiny Knight (Bards Tale II)***
**Electronic Arts**
**$39.95**
This sequel to *The Bard's Tale* embellishes the original game system in many ways, including 79 new spells and ranged combat. Characters from *Ultima III* can be used, and your team from *The Bard's Tale* can be imported to *Destiny Knight*

***Legacy of the Ancients***
**Electronic Arts**
**$29.95**
Legacy kicks off inside a Galactic Museum founded in the land of Tamalon by The Ancients long, long ago. The goal which you learn in a telepathic message beamed in from a Thief's spirit, is to destroy the Wizard's Compendium, a leather scroll you found on his body. Otherwise the scroll will fall into the wrong hands — the gnarled, grasping hands of an evil warlord.

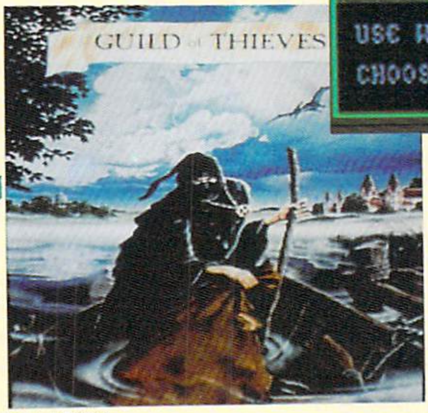
***Ultima V***
**Origin Systems**
**$59.95**
Twice as big as *Ultima IV* with more intricate character interaction and sharper graphics. The new combat and magic system is as much fun to play on paper as the computer so *Ultima V* will also be marketed as a traditional role-playing game (along the line of *Dungeons and Dragons*).

Maniac Mansion

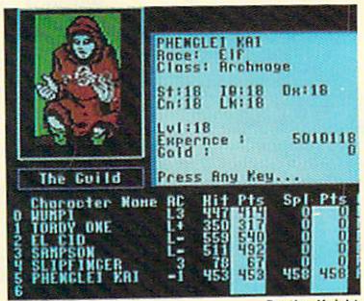



Legacy of the Ancients




Guild of Thieves




Destiny Knight

# AMIGA

by Shay Addams

*Ultima III*
**Origin Systems**
**$39.95**
This is one of the classics. It is set in the land of Sosaria, where your target is Exodus, the vile spawn of Mondain and Minax. The magic system is inventive, and plenty of animated combat awaits the adventurer.

*Guild Of Thieves*
**Firebird**
**$39.95**
A second adventure from the people who brought you *The Pawn.* This adventure is also set in Kerovnia, however this time . . . "You are an aspiring member of the infamous Guild Of Thieves. As a test assignment you have been told to ransack a castle and the surrounding area of all valuables."

*Bureaucracy*
**Infocom**
**$39.95**
You are about to start a new job at Happitech, Inc. The company is sending you on a course for new employees in Paris and they mailed you a $75 check for cab fare to the airport. However, your change of address form went awry and your mail was delivered to your neighbors. Rounding it up is no easy task, for these folks are so paranoid that they make Woody Allen look secure.



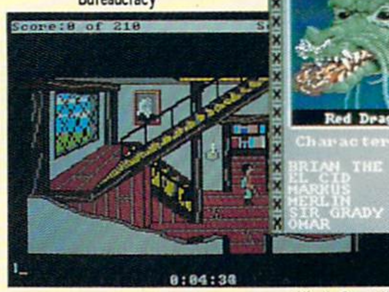
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*The Bard's Tale*
**Electronic Arts**
**$39.95**
Few role-playing games convey the authentic atmosphere of *Dungeons and Dragons* as well as *The Bard's Tale.* You are out to rescue the town of Skara Brae from Mangar the Dark (you guessed it, an evil wizard). If you have a tattoo on your left shoulder that says "Born to map," then dive in.

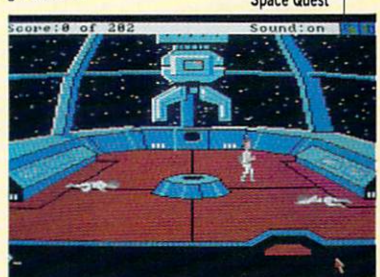

King's Quest III



The Bard's Tale

*Space Quest*
**Sierra On-line**
**$49.95**
Another of Sierra's 3D graphic adventure games. This one is an outer space, science fiction satire. Playing this game, in which your character and others are extremely well animated, is comparable to participating in an interactive, animated cartoon.

*King's Quest III*
**Sierra On-line**
**$49.95**
An adventure game with cartoon-like characters that you move around with joystick or keyboard commands. Smart parser, sharp graphics with many special effects, and logical puzzles. You are Gwydion, striving to escape the clutches of an evil wizard and claim your heritage.

Space Quest


*Roadwar 2000*
**Strategic Simulations, Inc.**
**$39.95**
You must find eight scientists whose work will eliminate an epidemic sweeping a futuristic North America devastated by nuclear bombs, foreign invaders, and a host of domestic troublemakers. A single car represents your gang as you press keys to move across a map of southern Canada, the U.S. and northern Mexico.

# ARCADE GAMES

## 64&128

by Mark Cotone

***Into the Eagle's Nest***
**Mindscape**
**$29.95**
The Eagle's Nest is a Nazi fortress that contains a labyrinth of rooms, hundreds of enemy soldiers, and three allied prisoners waiting to be rescued. Infiltrate, liberate and escape, and victory is yours. Fail, and you'll hit the reset button . . . again and again. Arcade adventure at its habit-forming best.

***Starglider***
**Firebird Software**
**$39.99**
An outer space shoot-out with all the necessary ingredients: sensational graphics, stomach churning flight simulation, pulse quickening combat sequences and an engaging novella to help set the stage. You'll play until your trigger finger aches from the strain.

***Rush'n Attack/Yie Ar Kung-Fu***
**Konami**
**$29.95**
Konami brings two of its more popular arcade games to the home screen. The first, an action-packed guerilla run behind Soviet lines, just might be the most addictive game of the year. The flip side is a martial arts kickfest. A delightfully satisfying double feature.

***Ghost'N Goblins***
**Capcom**
**$29.99**
The princess has been kidnapped, and you, brave knight, must don your armor and vanquish every dragon, zombie, ghost and goblin that stands between you and your lady. The challenge is just tough enough to keep you struggling without leaving you frustrated.

***Marble Madness***
**Electronic Arts**
**$29.95**
The coin-op comes home. It's you against gravity and the clock as you race your spherical vehicle across a treacherous track packed with marble menacing creatures of every design. The secret level will give you nightmares. Have a ball.

***Bop'N Rumble***
**Mindscape**
**$24.97**
Your famed professional wrestler moves out of the ring and onto the streets to escort Granny on a dangerous inner-city excursion. Use all the innovative tricks of your celebrated trade to keep the sidewalk freaks and gutter derelicts at bay. Fast, furious and funny.

***Comics***
**Accolade**
**$24.95**
Here's a new look: a comic book-style interactive adventure that incorporates several arcade games into its colorful cartoon storyline. It's an engaging blend, requiring the thinkers to get a little physical as well.

***Breakthru***
**Data East**
**$34.99**
The renegades have stolen the secret PK430 fighter plane, and you've been commissioned to get it back. With a durable armored assault vehicle at your disposal, you must traverse a deadly enemy obstacle course that takes you through mountains, prairies and cities. A classic arcade workout.

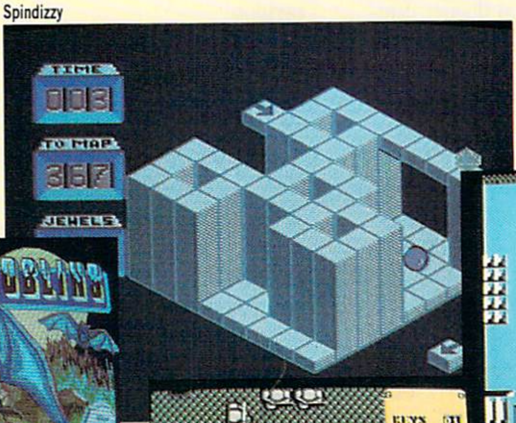
***Spindizzy***
**Electric Dreams/Activision**
**$14.95**
Try this British import once, and you'll be hooked for life. It's a series of 386 three-dimensional mazes that must be traveled by a precise, joystick-controlled, land mapping unit. It's unique, it's demanding, and it's cheap.

***Parallax***
**Mindscape**
**$29.95**
More devious than *Xevious*, its look-alike coin-op cousin, because this game requires players to do more than simply shoot on sight. The alien world you're so eager to destroy must first be combed for clues to a secret password. Stimulating sci-fi action.

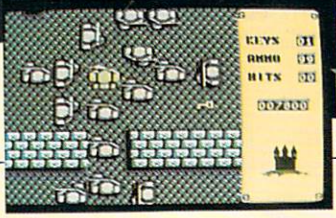
Starglider



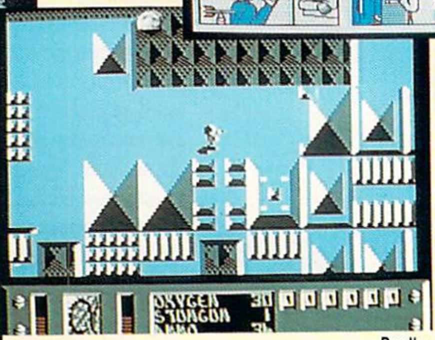

Comics

Spindizzy



Ghost'N Goblins

Into the Eagle's Nest


Parallax

# AMIGA

by Gary Fields

*Ferrari Formula One*
**Electronic Arts**
**$49.95**
High speed racing action on 16 international race courses. One to eight drivers can compete. Detailed realism puts you in the driver's seat. You can even check on the cars behind you by glancing in the Ferrari's two rearview mirrors.

*Starglider*
**Rainbird/Firebird**
**$44.95**
High speed air combat with a 3D view. Attack both surface and air targets with lasers or missiles while avoiding their counter fire. Quick reflexes and sound strategy required to win. Sound effects and graphics wonderfully realistic.

*Marble Madness*
**Electronic Arts**
**$39.95**
Realistic motion and gravity effects make guiding a marble through a 3D maze on six levels a real challenge. Play against another player or the clock. Sound and graphics are as good as the 50 cent arcade version.

*Fire Power*
**MicroIllusions**
**$24.95**
Tank battle game with realistic graphics matched with arcade speed and sound effects. Includes options for different tanks and scenarios. You play against the computer, another player or a friend (connected via modem) anywhere in the world.

*World Games*
**Epyx Inc.**
**$39.95**
To compete you must be good in all eight events including log rolling, sumo wrestling, bull riding and cliff diving. To win you must be great in more than a few. Action, graphics and sound effects are good.

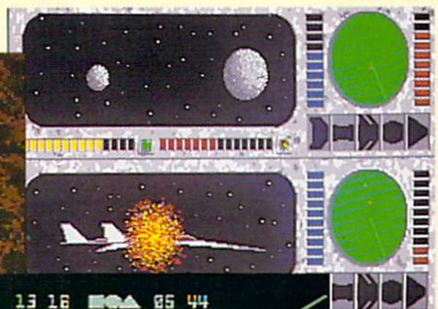
*Terrorpods*
**Psygnosis**
**$39.95**
Arcade action paired with strategy are required to defeat invading Tripod forces. Uses a huge 3D scrolling playfield.

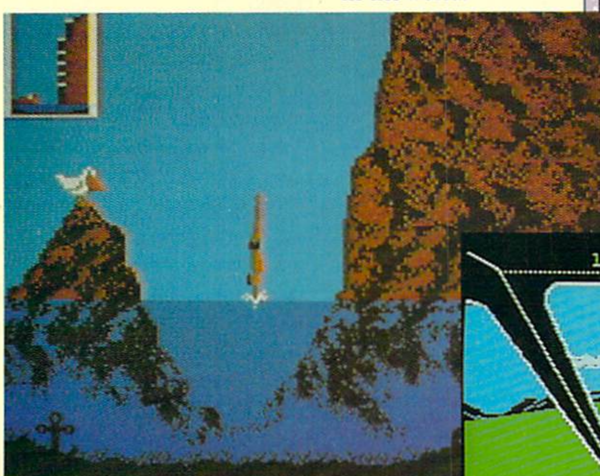
*Galactic Invasion*
**MicroIllusions**
**$24.95**
Space battle at arcade speeds across a battlefield as big as the universe. You can play against the computer, another player or a friend (via modem play option) anywhere in the world.

*Skyfox*
**Electronic Arts**
**$39.95**
Superfast aerial combat. Flying a plane equipped with radar-guided and heat-seeking missiles, laser cannons, and deflection shields you take on an armada of enemy tanks and planes. Game includes 15 scenarios and five skill levels.

*Diablo*
**Classic Images**
**$29.95**
The idea is simple — move a ball through a maze — but the maze keeps moving. To succeed you'll need good reflexes combined with strategic planning and quick thinking. Addictive.

Galactic Invasion





World Games



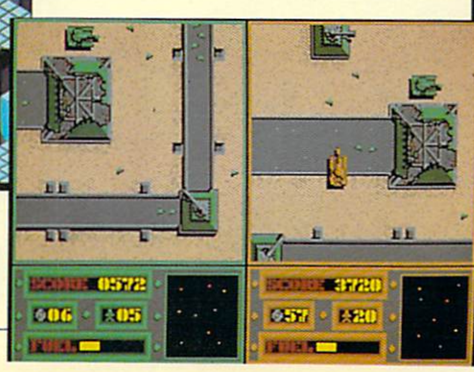

Skyfox



Ferrari Formula One



Marble Madness



Fire Power

# SIMULATIONS

## 64 & 128

by John Jermaine

**_World Class Leaderboard_**
**Access Software, Inc.**
**$39.95**

*Leaderboard* was an excellent golf simulation because the player selected the proper clubs, putting and technique for sinking a particular shot (as if he were actually there on the fairway or green). *World Class Leaderboard* takes things a step further by providing more traditional courses with traps, roughs, and a large number of trees per hole. If things get any more realistic, the player will be tipping a few at the local country club after each round.

**_Tenth Frame_**
**Access Software, Inc.**
**$39.95**

In the past, bowling programs have had interesting graphics and played like the typical arcade game, but somehow they failed to generate the true spirit of the sport. *Tenth Frame,* on the other hand, transports the user to a three-dimensional bowling alley, where he faces the same problems encountered by real bowlers. The player must learn how to control the spin and speed of the ball as he experiments with various methods of picking up different pin combinations. This is one of the better sports simulations on the market.

**_Aliens_**
**Activision**
**$34.95**

Aliens isn't just another arcade game "bug hunt." It dares you to pilot a drop-ship, take command of a squad of marines, and eventually fight it out, one-on-one, with the queen mother of an alien race. The weapons, devices, and dialogue of the popular *Aliens* movie can also be found in the program. I was very pleased with this special simulation because each game (there are six of them) is a carefully reconstructed scene from the film.

**_Pirates!_**
**MicroProse**
**$39.95**

From 1560 into the 1700's, the West Indies was home for an infamous breed of men known as pirates or buccaneers. These brave souls navigated the treacherous waters of the Caribbean, trading goods with some communities and supporting the rule of certain island governors. Unfortunately, they were also plundering settlements in the region and capturing ships which appeared to be easy marks. If you'd like to try swashbuckling thrown in for good measure, load in this historic reflection of the past.

**_PHM Pegasus_**
**Electronic Arts**
**$29.95**

You don't hear much about Patrol Hydrofoil Missile Craft (PHM), but they are a powerful secret weapon against naval terrorism and piracy on the high seas. These fast-moving attack and surveillance vessels move smoothly across the water, even in heavy seas. *PHM Pegasus* seems to be very authentic, and the eight program assignments could actually take place in the global hot spots of the world.

**_California Games_**
**Epyx, Inc.**
**$39.95**

This program faithfully re-creates six popular pastimes which became famous on or near the beaches of California. These challenges include: half pipe skateboarding, performing stunts with a foot bag, riding a surf board, roller skating on the boardwalk, BMX bicycle racing, and throwing a flying disk to a nearby companion. I know these events will probably never reach Olympic status, but they're accurately depicted, fast moving, and fun. *California Games* also provides a means of trying several perilous activities without risking injury to your body or possibly drowning.

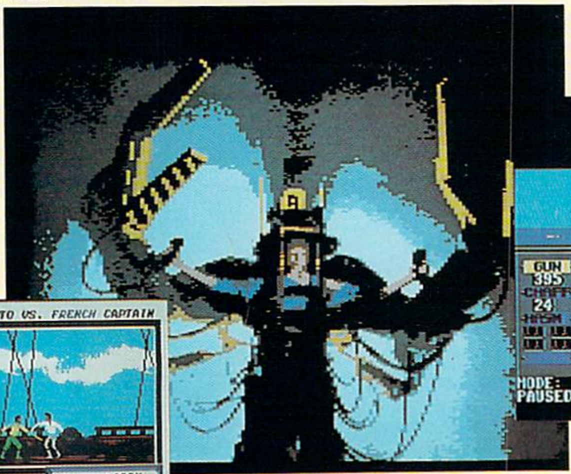
**_Gunship_**
**MicroProse**
**$34.95**

Knocking out a target with a jet fighter is one thing. Destroying that same item, with an Apache Gunship Helicopter, is a whole new ballgame. Probe large areas of enemy territory, at a height of 100 feet, using advanced weapons and missiles to wipe out unfriendly military forces. Doing the job right earns you rank, medals and the appreciation of your country. Make several mistakes and . . .

**_Wheel of Fortune, Family Feud_ and _Jeopardy!_**
**ShareData**
**$12.99 each**

Television game shows are the current rage on the boob tube, so bringing these three games out for 64 users was a very wise move. Each program follows the rules of its TV counterpart. The graphics of the playing boards are almost identical to the designs used on television, and every question used in these programs actually appeared on the game shows. You can even participate in a single player match against fast-thinking computer opponents. In short, these products are well done and give you the perfect opportunity to see how well you could do on one of the shows.

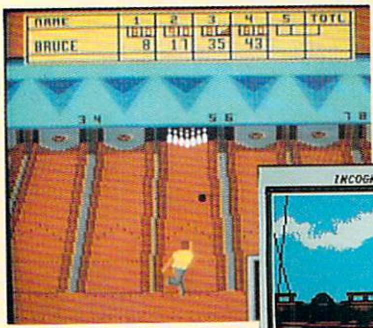
Aliens

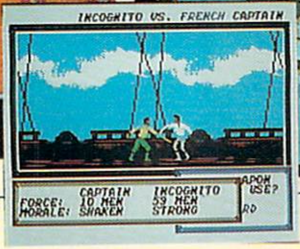





PHM Pegasus

Tenth Frame




Pirates!

# AMIGA

by Gary Fields

### *Flight Simulator II*
**SubLogic**
**$49.95**

The benchmark flight simulator against which all others are compared just got better. Graphics and animation are perfect. A multi-player option allows two players using computers connected via modem to fly with each other.

### *Silent Service*
**MicroProse**
**$39.95**

World War II submarine warfare. You can hunt and sink enemy ships and convoys anywhere in the Pacific. Sound strategy required to survive. Multiple options combined with wonderful graphics make this an impressive simulation game. (512K Required)

### *S.D.I.*
**Cinemaware/Mindscape**
**$49.95**

A mixture of arcade action and futuristic story line makes this simulation of a future war begun because of the employment of the Strategic Defense Initiative more than a war simulation. 3D graphics and real-time speed make the job of defeating Russian missiles, KGB agents and rocket fighters almost too realistic. (512K Required)

### *Balance of Power*
**Mindscape, Inc.**
**$49.95**

Geopolitical strategy game. The United States is matched against Russia. The idea is to sway world opinion in your favor without starting World War III. If you lose, the world loses. Not for novice players. (512K Required)

### *Kampfgruppe*
**Strategic Simulations, Inc.**
**$59.95**

WWII simulation — Germany against Russia. The game uses historical scenarios or you can create your own. Over 45 units, infantry, tanks, artillery, etc. included. Variable difficulty levels included. (512K Required)

### *Ogre*
**Electronic Arts**
**$39.95**

A twenty-first century battle between hovercrafts, armored tanks, tactical nuclear devices and a futuristic super robot tank — Ogre. Strategy game for one or two players. (512K Required)

### *Galileo*
**Infinity Software, Inc.**
**$99.95**

Turns your Amiga into a powerful planetarium. View all the planets and 1600 stars from any point on earth and any time in history. Witness soar eclipses and trace constellations.

### *Shanghai*
**Activision**
**$44.95**

An addictive strategy game devised from the ancient Chinese game of Mah Jongg. Graphics are beautiful. Only the very best will ever come eye-to-eye with the dragon. Compete against another player or the clock.

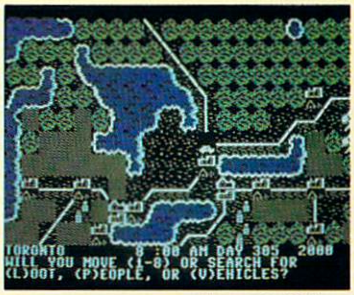
### *Roadwar 2000*
**Strategic Simulations Inc.**
**$39.95**

As a patriotic road gang leader you must locate eight scientists to save what's left of the world after civilization's downfall. You must battle mutants, cannibals and rival road gangs in your cross-country race.

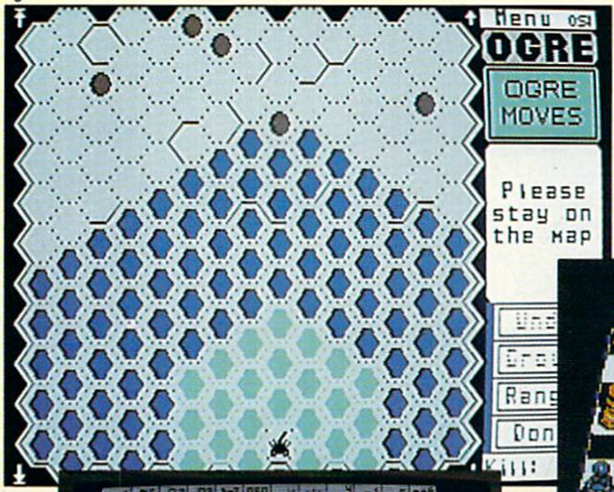
### *The ChessMaster 2000*
**Electronic Arts**
**$39.95**

This chess simulator includes every feature a serious competitor could want. Boards can be displayed using either 3D or 2D graphics. Program talks.

Roadwar 2000

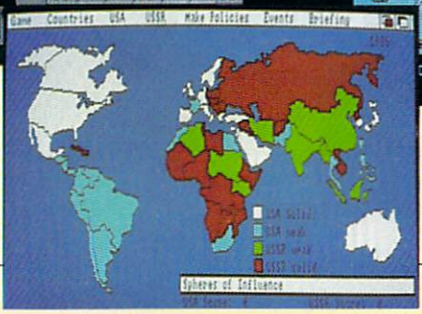


Ogre

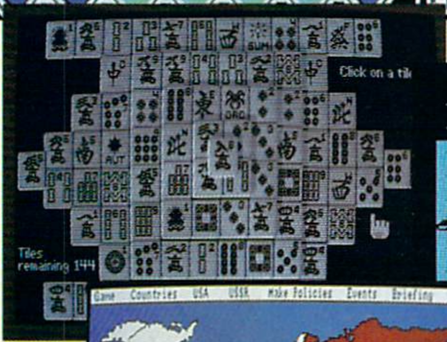



Chessmaster 2000

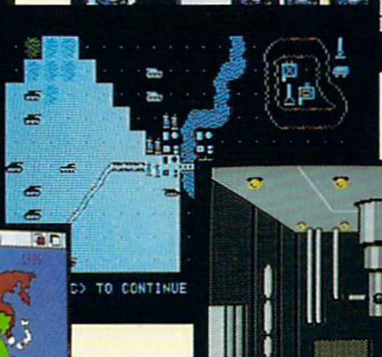




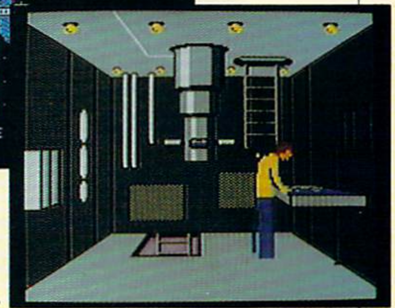
Shanghai



Kampfgruppe



S.D.I.



Balance of Power

# Sports

THE BEST OF 1987

## 64 & 128

by Scott A. May

### *California Games*
**Epyx, Inc.**
**$39.95**

Six like totally rad sports for up to eight players. Half Pipe Skateboarding, Foot Bag, Surfing, Roller Skating, BMX Racing, and Flying Disk. Awesome graphics, animation and gnarly competition make this the *best* in Epyx's long line of tournament sports games. Totally tubular, for sure.

### *World Class Leaderboard Golf*
**Access Software**
**$39.95**

The latest — and greatest — version of the Carver brothers' award-winning golf classic. Includes accurate depictions of three real-life courses, plus a fictionalized killer called "The Gauntlet." If 72 holes aren't enough, build your own with the easy-to-use Course Editor. Absolutely the best golf simulation ever designed.

### *Street Sports Baseball*
**Epyx, Inc.**
**$39.95**

A rough-and-tumble trip down memory lane for players of all ages and skill levels. Colorful graphics and smooth player control make this one easy to play, yet hard to put down. Improvised baseball for the sheer fun of it.

### *The Official America's Cup Sailing Simulation*
**Electronic Arts**
**$24.95**

Exciting simulation of ocean sailboat racing. Player control is technically brilliant, aided by a top-notch instruction manual. This is a tough sport to duplicate on a computer, yet the designers pull it off with flying colors.

### *GLF Football*
**Gamestar/Activision**
**$34.95**

At last, a unique — and natural — slant to computer football: true first-person, on-field perspective coupled with bruising 3D action. You'll almost feel black and blue after playing this grueling contest.

### *Championship Wrestling*
**Epyx, Inc.**
**$39.95**

An authentic, tongue-in-cheek look at professional wrestling. This one has all the right moves, plus a fabulous multiplayer option. Complex, yet rewarding for those tough enough to stick it out.

### *FIST — The Legend Continues*
**Mindscape**
**$29.95**

A successful blend of action adventure and the sport of karate. Avoid traps and solve puzzles as you battle increasingly-skilled adversaries. Outstanding graphics and smooth animation make this one a real winner.

### *World Games*
**Epyx, Inc.**
**$39.95**

Span the globe, competing in sports native to eight different countries. Includes Weightlifting, Barrel Jumping, Cliff Diving, Slalom Skiing, Log Rolling, Bull Riding, Sumo Wrestling and the Caber Toss. Diverse action and great visuals add up to a captivating experience.

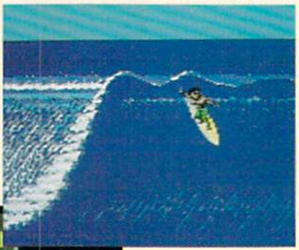
### *Championship Baseball*
**Gamestar/Activision**
**$34.95**

More than just a rehash of an old favorite — *Star League Baseball* — this latest version offers split-screen player perspective, improved graphics and challenging tournament play. Solid long-term value.

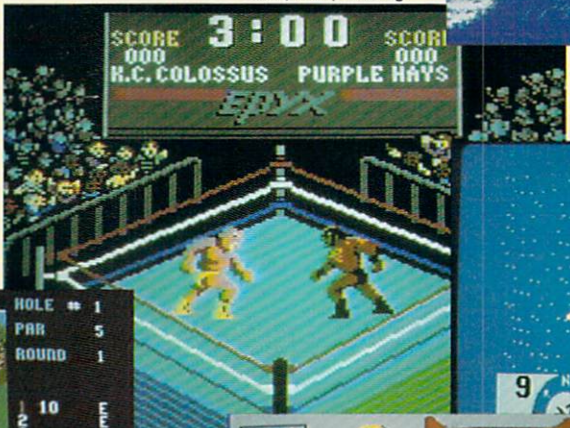
### *Indoor Sports*
**Mindscape**
**$29.95**

Four games that simulate rainy day fun: Darts, Bowling, Air Hockey and Ping-Pong. Unevenly designed, yet full of surprises. Worth the price of admission for Air Hockey and Ping-Pong alone.

California Games

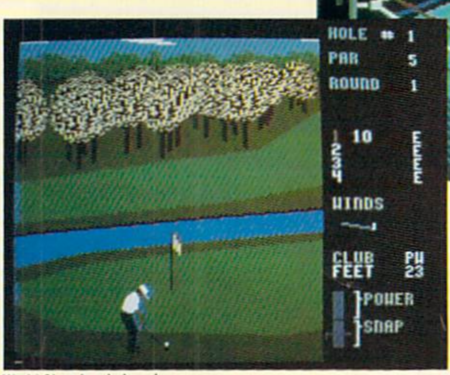


Championship Wrestling

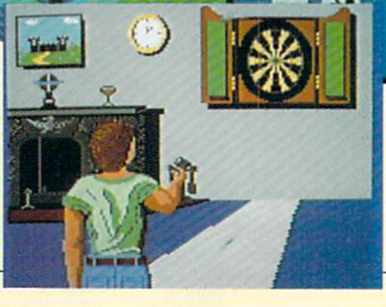



The Official America's Cup Sailing Simulation




World Class Leaderboard



Indoor Sports

# AMIGA

by Gary Fields

*Gridiron! V1.2*
**Bethesda Softworks**
**$59.95**
Football as it should be simulated. You control both the team and individual players. You can design your own team and playbook and play against the computer or another player. NFL DataDisk allows you to compete against actual professional teams. Multiple challenge levels. (512K Required)

*Earl Weaver Baseball*
**Electronic Arts**
**$49.95**
A baseball fan's dream game. Includes difficult levels from sand lot to major league, options to play on or manage a team. Outstanding split screen displays put you right behind home plate. Options include instant replay and slow motion. (512K Required)

*Mean 18*
**Accolade, Inc.**
**$44.95**
Realistic golf game, plus a golf course construction program so you can create and play your own courses. One to four golfers can compete. Impressive graphics and replay options. (512K Required)

*Winter Games*
**Epyx, Inc.**
**$39.95**
Simulates the different events of the winter Olympic games. One to eight players possible. Beautiful graphics and animation. (512K Required)

*Hardball!*
**Accolade**
**$44.95**
Multiple screens bring baseball to life and the action is realistic. You manage the team plus hit, pitch and field. You can even go into extra innings. (512K Required)

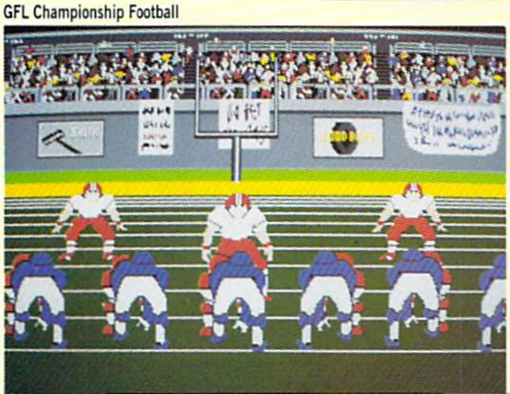
*GBA Championship Basketball Two-On-Two*
**Gamestar/Activision**
**$44.95**
True team play is what makes this basketball simulation so good. You play with a computer-controlled teammate, with another human teammate against the computer or against another player. Options include practice, exhibition and league play. Offensive and defensive plays are called via a joystick. Action is fast and realistic.

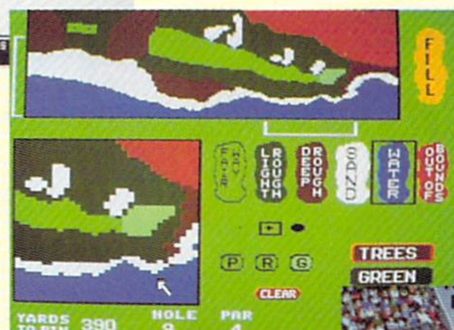
*Championship Golf*
**Gamestar/Activision**
**$54.95**
Beautiful 3D graphics matched with detail control make this an excellent golf simulation. You can view every object on a fairway from a variety of different viewing points. Graphics are detailed and precise. Not for the novice player. (512K Required)

*GFL Championship Football*
**Gamestar/Activision**
**$44.95**
This football simulation puts you on the playing field with a player's perspective. Includes dozens of offensive and defensive plays. Screen display is so realistic, you'll look for a place to hide when you see the tacklers coming. (512K Required)

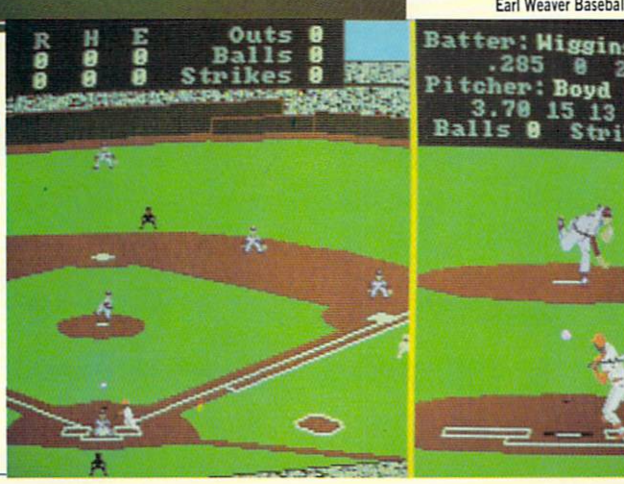
*Grand Slam*
**Infinity Software**
**$59.95**
Tennis challenge on the great courts of the world —Wimbledon, French, U.S. and Australian Open. Uses fast 3D graphics and sound. You can use topspin, lobs, slice serves and aggressive net play to win.

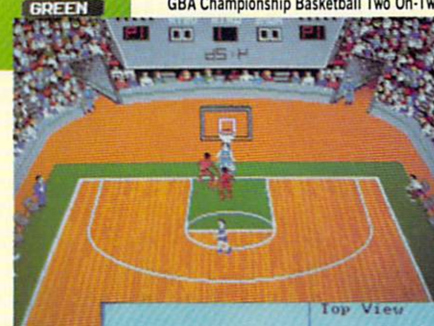
Winter Games

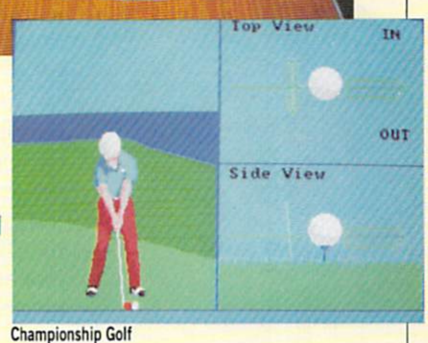

GFL Championship Football




Mean 18

Earl Weaver Baseball



GBA Championship Basketball Two On-Two




Championship Golf

# Music Software 64 & 128

by Bob Lindstrom

### *Enhanced Sidplayer*
**Compute! Books**
**$24.95**

Craig Chamberlain's *Sidplayer* was one of the most capable and popular composition programs for musicians who wanted to create 64 music files. Named after the 64's sound chip — the Sound Interface Device (SID) — *Sidplayer* provided the opportunity to dig deep into this silicon wonder and mine audio gold. This year the release of Chamberlain's *Enhanced Sidplayer* made the best even better. It includes improved 64 features and a brand new 128 version that fully supports the advanced abilities of that machine. An outstanding tool for the serious SID musician.

### *Instant Music*
**Electronic Arts**
**$29.95**

When they say "instant," they aren't kidding. Making music is as easy as loading a back beat and twiddling a joystick in this 64 conversion of Bob Campbell's Amiga original. Even 64 owners who don't know a grand staff from the Grand Canyon, can get down and jam along with *Instant Music*'s built-in library of tunes, bass lines and harmonies. Since the music is represented as colored blocks, it is possible to "paint" music onto the screen and then change the instrumental sounds for maximum variety. And the artificial intelligence that guides the programs keeps you from hitting those clinkers.

### *Personal Musician*
**Sonus**
**$129.95**

Once they taste SID, it's hard to keep them away from MIDI. Musicians and hobbyists who got their first taste of electronic music from the 64 are now moving up to the computer-controlled wonders of MIDI, the Musical Instrument Digital Interface. This standard for computer music allows you to use your 64 or 128 to control a wide variety of computer keyboards, drum machines and special effects generators. For those who just want to get their ears wet in this brave new world of musical amusement, Sonus' *Personal Musician* package is an introductory kit to MIDI. It includes a MIDI port that attaches the 64 to a MIDI keyboard, the necessary cables and a basic four-track sequencer that enables the computer to "record" the notes played on the keyboard. The package does not include the MIDI keyboard.

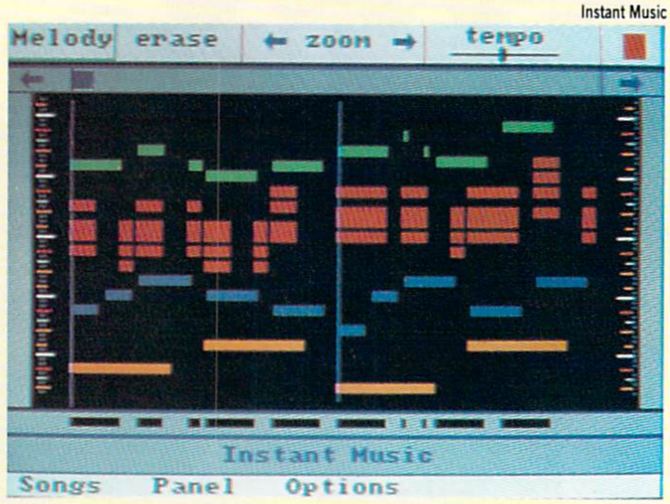
### *Mastertracks Pro*
**Passport Designs Inc.**
**$299.95 (128 only)**

An improved version of Passport Design's popular *Mastertracks* turns the 128 into a MIDI muscleman. The expanded memory of the 128 makes it possible to have sequencer, song editor and step editor modules in the computer at once and still have memory for larger sequences than in 64 *Mastertracks*. This elaborate program is not for the casual MIDI user or for the musically faint-hearted; but it presents a wealth of professional features for the expert MIDI musician.

### *FB01 Design*
**Sonus**
**$149.95**

By omitting the keyboard on its FB01 sound module, Yamaha brought its excellent synthesizer sound into a budget-minded priced range. It's the ideal, affordable MIDI music (black) box that is playable not by your fingers but by your computer. Sonus' *FB01 Design* is a voice editor and librarian that helps FB01 owners with a 64 or 128 program voices for the popular FB01 and save them to disk for later use.

Instant Music



# AMIGA

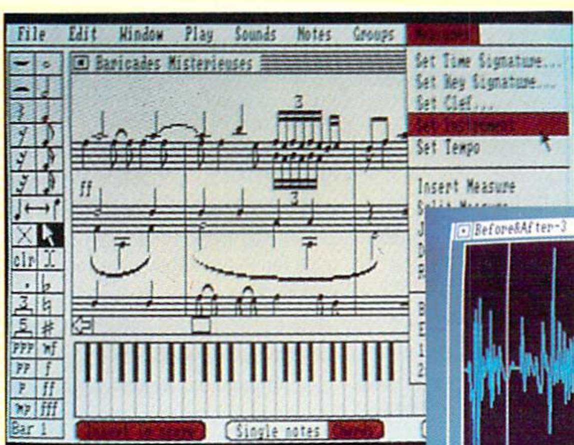
by Bob Lindstrom

*Aegis Sonix*
**Aegis Development**
**$79.95**

Amiga owners were overcome by deja vu when they saw *Aegis Sonix*. It bore a striking resemblance to the demo version of *Musicraft* that was on display at almost every Amiga dealer. Actually, *Sonix* is a greatly enhanced and improved version of *Musicraft*. The result was a stylish and easy-to-use music program that accessed the Amiga's four-voice digital sound as well as four channels of MIDI sound. And for those who didn't want to employ RAM-hungry digital sound samples, *Sonix* featured a full analog sound synthesizer to create custom voices. Though its note-editing abilities are slightly limited, *Sonix* offers a fast and flexible way to compose Amiga music files.

*Deluxe Music Construction Set*
**Electronic Arts**
**$99.95**

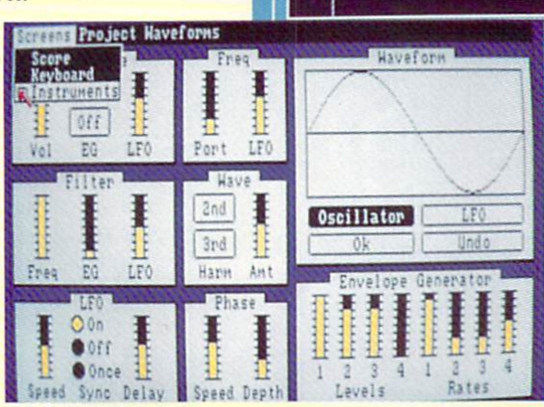
Will Harvey's *Music Construction Set* created the standard for joystick and mouse-controlled note editors. *Deluxe Music Construction Set* on the Amiga, programmed and designed by Geoff Brown and John MacMillan, carries that standard light years beyond its hobbyist beginnings. Though the program (written in the C computer language) is slightly sluggish during editing operations, *DMCS* remains the highpoint in Amiga note editors. In addition to generating music files, *DMCS* also excels in printing music, either in grand staff or score format. And the ability to import SMUS format files gives it a degree of compatibility with other Amiga music programs.



Deluxe Music Construction Set



Aegis Audiomaster



Aegis Sonix

*Soundscape Pro MIDI Studio 1.4*
**Mimetics Corp.**
**$149.95**

Programmer Todor Fay took multi-tasking seriously when he designed his professional MIDI studio for the Amiga. He designed *Soundscape* as a modular array of individual programs that incorporate MIDI control, note editing, sequencer, song editor, console keyboard, clock and even the ability to interface with and control video equipment. Not only a MIDI nerve center, *Pro MIDI Studio* is gearing up to make the Amiga serve as the heart of a complete audio-video system. A premature release yielded some problems with early versions of the program. The sheer complexity of the software is daunting to some users. Nonetheless, *Soundscape Pro Midi Studio* is the most ambitious and most expandable MIDI software yet created for the Amiga.

*Instant Music*
**Electronic Arts**
**$49.95**

It's the simplest and most painless way to enjoy Amiga music without being musical yourself. Just move that mouse and shake your booty. Bob Campbell's Amiga version of *Instant Music* boasts digital sound samples and lightning fast operation. Though it emphasizes the fun of music, some professionals have fallen in love with a graphic display that represents notes as blocks of color. They can paint a few high notes here, a run of low notes there and then move the music over to *Deluxe Music Construction Set* for fine-tuning. Two *Instant Music* data disks published by Electronic Arts provided additional scores and instruments.

*Aegis Audiomaster*
**Aegis Development**
**$59.95**

A chorus of howling dogs or a jazz break played by garbage can lids -the Amiga's digital sampling resources can turn anything into a musical instrument, if you have the right tools. *Aegis Audiomaster* makes any Amiga digital sampler the right tool. Its built-in digitizing module supports most Amiga sound sampling hardware including those from Mimetics, Futuresound and PerfectSound. The program also features a software oscilliscope to measure input levels as samples are recorded. Then, *Audiomaster* gives you the power to turn those sounds every which way but loose: Layer sample upon sample, play them backwards, chop out a piece, paste one in, hand draw your own sample, create a *Sonix* or IFF-compatible instrument, or use all your Fast-RAM to digitize a favorite song. *Audiomaster* really does the job.

THE BEST OF 1987

# Productivity Software

## 64

by Gary Fields

***Desktop Publisher***
**Timeworks, Inc.**
**$59.95**
True desktop publishing on an 8-bit computer. Includes Text Editor for headlines and captions, uses professional module page design, drawing tool for creating your own graphics, plus you can import both text and graphics from your favorite word processor or design package.

***geoWrite Workshop***
**Berkeley Softworks**
**$49.95**
This is a collection of professional publishing tools, controlled within the GEOS environment. *geoWrite* is a full-featured word processor which uses varied font types and sizes, plus it will accept graphics. *geoMerge* enables the user to auto-insert names and addresses into documents.

***Partner 64***
**Timeworks, Inc.**
**$59.95**
Creates a complete office environment including a mini word processor and Name/Address database, multi-function calculator and appointment calendar. This one turns your computer into a fast, clutter-free information center. Includes SwiftLoad.

***Word Writer 3***
**Timeworks, Inc.**
**$49.95**
This word processor is as professional as they get for the 64. Includes every command option a writer would want plus it includes Timeworks' wonderful Spell Checker with 85,000 words. A 60,000-word thesaurus and outline processor are also included. SwiftLoad speeds the 1541 drive to five times its normal speed.

***Thinking Cap***
**Broderbund Software**
**$34.95**
Perfect for organizing your thoughts. This outline processor makes it effortless to transfer and organize ideas to paper. A perfect tool for the student, business manager or writer with a lot of good ideas but who has difficulty organizing them on paper.

***geoPublish***
**Berkeley Softworks**
**$69.95**
Desktop publishing for users of GEOS. Employs multi-columns, graphics, multiple fonts and full-page preview. Works with both matrix and laser printers as well as expanded memory.

***Easy Working: Writer, Planner, Filer***
**Spinnaker**
**Three disks — $9.95 each**
The key word in the title is "easy." These three integrated programs combine amazing quality at an even more amazing price. Each uses drop-down menus and help screens. The word processor includes a 100,000-word spelling checker. *Filer* holds up to 50,000 records. *Planner's* maximum cell count is 50,000.

PocketWriter II



***Video Title Shop***
**DataSoft/Electronic Arts**
**$29.95**
Creates animated or still title screens which can be combined with home or business video tapes. Perfect for titling videos or creating promotional tapes. Comes with a graphic editor, fade in/out options and a variety of font faces and sizes.

***AwardWare***
**Hi Tech Expressions, Inc.**
**$14.95**
Design and print certificates, awards, licenses, coupons or announcements. Simple menu selection makes creating your own or customizing a standard document easy. You can also create a disk-based award which you can send to a friend to display on his or her 64 monitor.

## 128

by Gary Fields

***GEOS 128***
**Berkeley Softworks**
**$69.95**
Brings a desktop publishing environment to the 80-column display of the 128. Includes all the powerful programs of its little brother *GEOS 64* — word processor, graphic editor, calculator, note pad, on-screen clock, etc. Works best with a RAM expansion.

Video Title Shop





AwardWare

***BobsTerm Pro 128***
**Progressive Peripherals & Software**
**$79.95**
This is the most powerful yet easy-to-use terminal program on the market. It is compatible with every protocol, baud rate and modem and will even read and write to CP/M disk. All features are menu/window activated. On-screen help is included. A 60K buffer makes grabbing on-line files fast and easy, plus you can edit text files using the program's powerful editor.

***Personal Choice Collection***
**Personal Choice/Activision Software**
**$99.95**
This integrated package includes a word processor (Writer's Choice), database (Filer's Choice) and spreadsheet (Planner's Choice), and a 50,000-word speller, 80-column display.

***T.H.I.S.***
**Micro Aided Designs**
**$59.95**
**($139.95 with lightpen)**
Powerful graphic design package for those with expanded RAM. Uses four screens, pull-down menus and either mouse or lightpen input. Features included are cut, paste, copy, zoom, grids, seven fonts, geometric shapes and variable line width.

***The Accountant V2.0***
**KFS Software**
**$149.95**
New version is a complete business accounting system for businesses with up to 100 employees, 700 customers and 3000 inventory items. Modules include a general ledger, payroll and accounts receivable and payable.

# AMIGA

by Gary Fields

*PocketWriter II*
**Digital Solutions**
**$49.95**
One of the most complete and easy-to-use 80-column word processors on the market. On-screen help included. Uses either SEQ or PRG files.

*Business Form Shop*
**BetterWorking/Spinnaker**
**$39.95**
Design business forms to fit you or your company's specific need. Forms can be up to 100 pages long and can vary in page dimension. Final template can be duplicated and will run independently of the parent program so you can save different forms to different disks.

*WordPro 128 with FilePro 128*
**BetterWorking/Spinnaker**
**$39.95**
Integrated word processor and database. *WordPro* includes a 100,000-word speller and traditional formatting features. Uses double key editing commands, and documents can be previewed to screen before being dumped to a printer. *FilePro* will hold 4000 records per file, search and sort capabilities with up to 20 variables.

*Term Paper Writer*
**Personal Choice/Activision**
**$49.95**
Helps the writer, student or professional organize his thoughts. Includes a Notetaker program for collecting information, an Outliner for organizing the notes and a full-featured word processor for finishing the document. The program will insert footnotes on appropriate pages and compile a bibliography by drawing information from notes taken.

*PageSetter* *
**The Gold Disk**
**$149.95**
Desktop publishing. Includes both graphic and text editors and a variety of type for headlines and captions. Text and graphics can be created with the program or imported from other word processors or design packages. The screen displays the page using three degrees of magnification to show on screen how the page will print out on either a matrix or laser printer.

*WordPerfect* *
**WordPerfect Corporation**
**$395.00**
Professional quality word processor. Includes a speller and thesaurus and supports footnotes and macros. Employs all the traditional word processing tools professional writers demand plus mail-merge and math and text columns.

*DeluxePaint II* *
**Electronic Arts**
**$129.95**
Professional graphic design program. Supports on-screen canvas areas as large as 8 1/2 x 11 inches, stencils, brushes, two work screens, mirror, text and magnification, etc. Uses Lo-Res, Med-Res, Interlace and Hi-Res formats and all of the Amiga's 4096 colors.

*B.E.S.T. Business Management* *
**Business Electronics Software & Technology, Inc.**
**$395.00**
The program's integrated modules include functions for order processing, inventory and service management, accounts payable and receivable and a general ledger. Supports single, dual or hard drive systems.

*Logistix* *
**Progressive Peripherals & Software**
**$249.95**
Integrated spreadsheet, database and time management project package. Compatible with dBase and DIF files and supports true macro commands. Comes with a large, thorough manual. Works with RAM expansion.

*Draw Plus* *
**Aegis Development**
**$249.95**
Professional Computer Aided Design (CAD) software. Perfect for architecture, landscaping, drafting or any product design requiring precision drawing. Tools include all the traditional, plus ellipses, polygons, rotate, drag, distort, resize, etc.

*Diga!* *
**Aegis Development**
**$79.95**
Versatile terminal program with all standard protocols, multiple screen options, menu driven. Works with memory expansion and hard disks. Built-in buffer for easy downloading and saving.

*DeluxeVideo V1.2* *
**Electronic Arts**
**$129.95**
Create your own videos. You can design your own animated videos, including graphics, animation, sound and music, or import them from other standard IFF files. Display is full screen, works with RAM expansion and GenLock if installed.

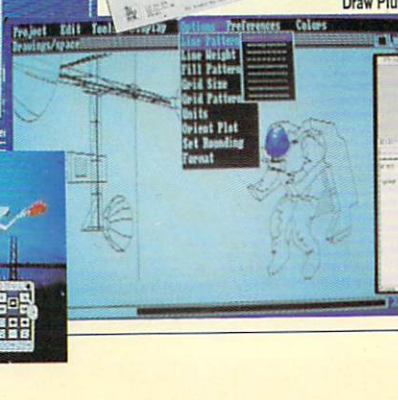
*ProWrite* *
**New Horizons Software**
**$124.95**
Quality word processor with color graphic abilities. Includes headers, footers, professional editing commands, multiple screen display and fonts, plus color. Menu driven. Allows multiple documents to be open at the same time. Text and graphics can be mixed.

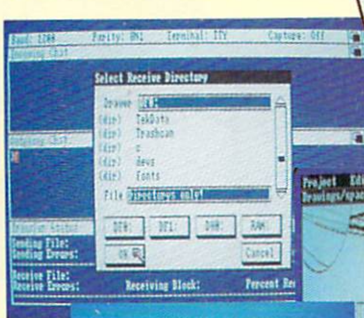
*CLImate*
**Progressive Peripherals & Software**
**$39.95**
Disk utility aid. As easy to use as the Workbench, but lets you examine, copy, move, delete, rename, display or print any file on a disk. Will display files using either ASCII or HEX code. All options mouse driven.

PageSetter



Draw Plus

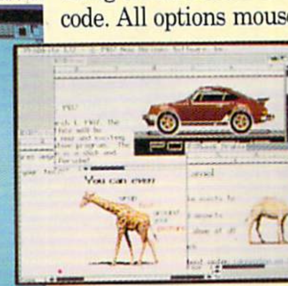




Diga!



Deluxe Video V1.2



ProWrite

*512K Required

# Education Software

## 64&128

by Jack Emberly

*Bank Street School Filer*
**Sunburst**
**$99.00**
For grades 4-12, *Bank Street School Filer* is designed to help teachers integrate databases into classroom curriculum. Great for home use too.

*Astronomy Databases*
**Sunburst**
**$59.00**
Important dates, people, events in the history of astronomy. Great home or school resource.

*United States Database*
**Sunburst**
**$59.00**
Geography, political, historical information for each of the United States.

*North America Database*
**Sunburst**
**$59.00**
Explores people, climate, culture, economy, government. Excellent informational resource.

*Endangered Species Database*
**Sunburst**
**$59.00**
Explores information on the world's most endangered vertebrates and invertebrates, conditions of life, location and problems faced by each. Home or school.

*Building Perspective*
**Sunburst**
**$65.00**
Problem-solving program that challenges grade four through adult to predict the composition of a 3 × 3 or 5 × 5 array of building seen from various angles. Tough, but superb thinking skills development, and fun!

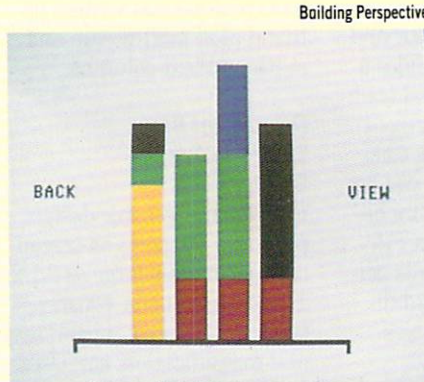
*Castle Clobber*
**Mindscape**
**$59.00**
*Castle Clobber* is a recent relative of the older Tink Tonk series. Tonk negotiates the passages of a scary castle to find and retrieve a stolen toy chest. More than good fun. Making logical predictions and decisions make it excellent problem solving at the grade one through five level.

*Simon Says*
**Sunburst**
**$65.00**
Students practice sequencing by remembering a series of letters, numbers or colors. Players are challenged with longer sequences as they become more proficient. (For K-Adult.)

*Teddy and Iggy*
**Sunburst**
**$65.00**
Students (grades K-2) help Teddy and Iggy perform tasks to reinforce a basic memory skill called chaining—remembering items in a sequence.

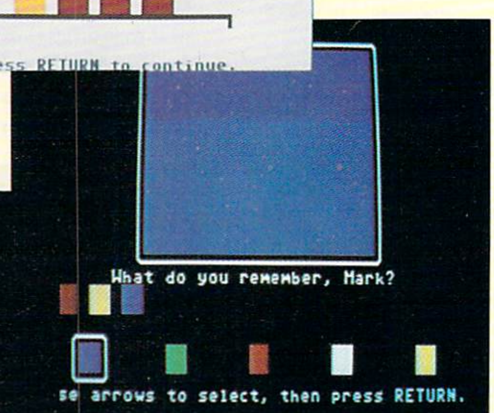
*Mathematics Activities Courseware*
**Houghton Mifflin**
**$150 per grade level**
Grades one through eight. This supplementary classroom material teaches thinking while reinforcing all major math skills taught in grades one through eight. Copies of this would be valuable to any home with kids.

Building Perspective

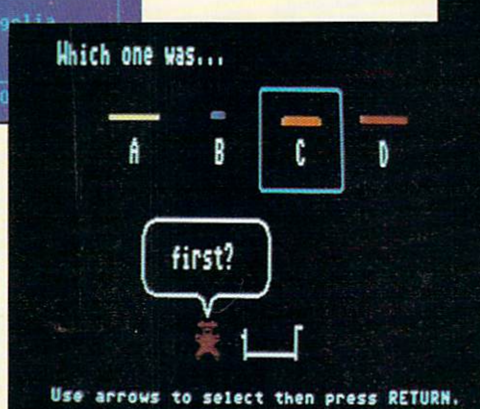



Bank Street School Filer




Simon Says




Teddy and Iggy

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Woods Cross, UT 84087
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**Activision**
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**Aegis Development**
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Santa Monica, CA 90403
(213) 392-9972

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Hauppauge, NY 11788

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Berkeley, CA 94704
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**Broderbund Software**
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**Byte by Byte**
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**Epyx, Inc.**
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**Firebird Software**
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Waldwick, NJ 07463
(201) 444-5700

**Gold Disk**
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**Hi Tech Expressions, Inc.**
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Plantation, FL 33313
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**Houghton Mifflin**
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Boston, MA 02108
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**Infinity Software**
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**Infocom**
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**MicroIllusions**
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**Microlog**
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(512) 329-6215

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Londonderry, NH 03053
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**Passport Designs**
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**Progressive Peripherals & Software**
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Denver, CO 80204
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**Psygnosis Limited**
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Addison, IL 60101
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**ShareData**
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Suite C170
Chandler, AZ 85226
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**Sierra On-Line**
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Coarsegold, CA 93614
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**Spinnaker**
One Kendall Square
Cambridge, MA 02139
(617) 494-1200

**Strategic Simulations, Inc.**
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Mountain View, CA 94043
(415) 964-1353

**SubLogic**
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**Sunburst**
39 Washington Avenue
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COMMODORE 64 and AMIGA

# GRAPHICS CONTEST

*Commodore Magazine is sponsoring our third Graphics Contest. This year we have added an Amiga category for aspiring Amiga artists out there, in addition to the Commodore 64 category. Winners will receive a cash prize and the winning graphics screens will be published in the June, 1988 issue of* ***Commodore Magazine.***

## Commodore 64 Category Prizes

Grand Award: $500 and Publication in *Commodore Magazine*
Five Runners Up: $100 and Publication in *Commodore Magazine*
Honorable Mention: Publication in *Commodore Magazine*

## Amiga Category Prizes

Grand Award: $500 and Publication in *Commodore Magazine*
Five Runners Up: $100 and Publication in *Commodore Magazine*
Honorable Mention: Publication in *Commodore Magazine*

### GRAPHICS CONTEST RULES

**1.** This contest is strictly for amateur artists. Anyone who derives more than 10% of their annual income from the sale of original artwork is ineligible.
**2.** Employees of Commodore Magazine, Inc., Commodore Business Machines, Inc., Commodore Electronics Ltd., Commodore International Ltd., their advertising and promotional agencies and their immediate families are not eligible to enter this contest.
**3.** Each entry must be wholly the product of the developer in whose name the entry has been submitted. Copyrighted images are not eligible. This includes record album covers, movie figures, famous paintings and cartoon characters. Outside assistance is expressly prohibited and will provide cause for disqualification.
**4.** A maximum of two screens per person is allowed. You may submit either two screens for one computer or one screen for each computer. If a contestant submits more than two screens for consideration, all of that person's entries will be invalidated.
**5.** All entries must be submitted on disk, 1541 format for the Commodore 64 and 3.5-inch format for the Amiga, with the following marked clearly on the disk's label:
  a. Contestant's name, address and phone number
  b. Picture title(s)
  c. Graphics package or programming aid used to create the graphics
  d. The words "GRAPHICS CONTEST"

A photo of the screen display or a printed copy of the screen does not constitute an acceptable entry.
**6.** Mail entries before January 31, 1988 to *Commodore Magazine*, 1200 Wilson Drive, West Chester, PA 19380, ATTN: GRAPHICS CONTEST.

### GENERAL CONDITIONS

> Graphic screens are judged on originality, creativity and best use of the computer's unique graphics features.
> Entries will be judged by the staff of *Commodore Magazine.*
> Make sure your mailer will protect your disk from damage. Affix sufficient first-class postage. Mail your disk and the official entry blank to the address shown above in time to reach us by the January 31, 1988 deadline.
> Entries become the property of *Commodore Magazine*, which reserves the right to adapt, use or publish all entries received. No disks will be returned, so be sure to make a copy of your entry before you submit it to the contest.
> Non-winning entries will not be acknowledged. Winners will be notified by February 28, 1988. Taxes on cash prizes are the winners' responsibilities.

**PLEASE PRINT**

NAME ______________________ PHONE ______________________
ADDRESS ______________________
CITY ______________________ STATE __________ ZIP __________
AGE __________ SIGNATURE ______________________
PARENT'S SIGNATURE (IF CONTESTANT IS UNDER 18) ______________________
PICTURE TITLE #1 ______________________ COMPUTER __________
GRAPHICS PACKAGE OR PROGRAMMING AID USED ______________________
PICTURE TITLE #2 ______________________ COMPUTER __________
GRAPHICS PACKAGE OR PROGRAMMING AID USED ______________________

**DEADLINE FOR ENTRY: JANUARY 31, 1988. MAXIMUM 2 SCREENS PER CONTESTANT.**

# Little Names Behind the Big Names

by Gary V. Fields

Here's a quick quiz. Who wrote these four successful books: *The Hobbit, The Once and Future King, The Thorn Birds* and *The Road*? Chances are you knew most, but for those who didn't, the authors in order are: J.R.R. Tolkien, T.H. White, Colleen McCullough and John Ehle.

Now let's take the same quiz with software. Who wrote these four successful programs: *BobsTerm Pro 128, The Bard's Tale, Gridiron!* and *Championship Golf*? If you answered Bob Lentini, Michael Cranford, Edward Fletcher and co-authors Jerry Shurman and Henry Perkins your awareness is exceptional. I would be surprised if more than a few scored 100% on the second quiz. Instead of the program's author, it is usually the software publisher's name we associate with a title.

Contrary to what software pirates want you to believe, software does not just appear; it isn't birthed through spontaneous generation nor created by super computers. Each title is developed slowly, lovingly and laboriously by sleepy-eyed programmers. Many willingly risk years of their lives and even their futures on project ideas they believe strongly in.

Like most successful authors through the ages, the efforts of a would-be professional programmer are not always as quickly acknowledged as he/she would prefer. As a result, most must endure some lean, hungry, even penny-pinching times waiting for their chance to be published. Thankfully, for each of the guys I talked with, those lean years appear to be behind them. To a man they began on their individual road to professional programming just like the rest of us computer owners — they had an unquenchable enthusiasm for computers and recognized the possibilities they possess. Each began his career with a different background, at a different age and ultimately achieved a different position in the industry. But they are all doing exactly what they want to do, all are successful and each has been financially rewarded for his contributions.

The best way to learn their story is from their own words. If you have any ambitions to program professionally, heed well their words, and perhaps you can avoid some of the pitfalls they had to endure. If you are a user of software rather than a doer, you'll probably come away with an elevated appreciation for the efforts and hours put into the programs you enjoy.

Brian Fargo is a 24-year-old programmer turned business owner. He is president of Interplay Productions, a California-based software company which employs a staff of equally young computer specialists like Jerry Shurman, Henry Perkins and Michael Cranford. In a four-year period they have developed nearly 60 software titles which are distributed by large publishing companies like Activision and Electronic Arts. Fargo grew up with a computer. His company is best known for graphic adventures and sports simulations.

Edward Fletcher, though three years older than Fargo, has been programming professionally for only two years. He is the co-founder of Bethesda Softworks in Maryland and the author of *Gridiron!*, the yet-to-be-topped football simulation for the Amiga. Fletcher became involved in computers while in college. His interests are in the entertainment and simulation fields of programming.

At age 37, Bob Lentini would be considered the dean of the group. His introduction to computers was quite different than most. He gave up a good paying job traveling the country, rubbing elbows with the top performing singers of the time to explore computers. In a very real way, he was drawn to computer programming both out of curiosity and for relief from boredom. Before his first successful effort, *Bobs Term Pro*, he paid the bitter, hungry dues of an artist seeking to be discovered. Lentini still lives in Las Vegas, but commutes to the east coast regularly to write for a company which has not only given him the freedom he needs to be creative, but also the financial rewards a true artist deserves. He has concentrated on developing productivity software.

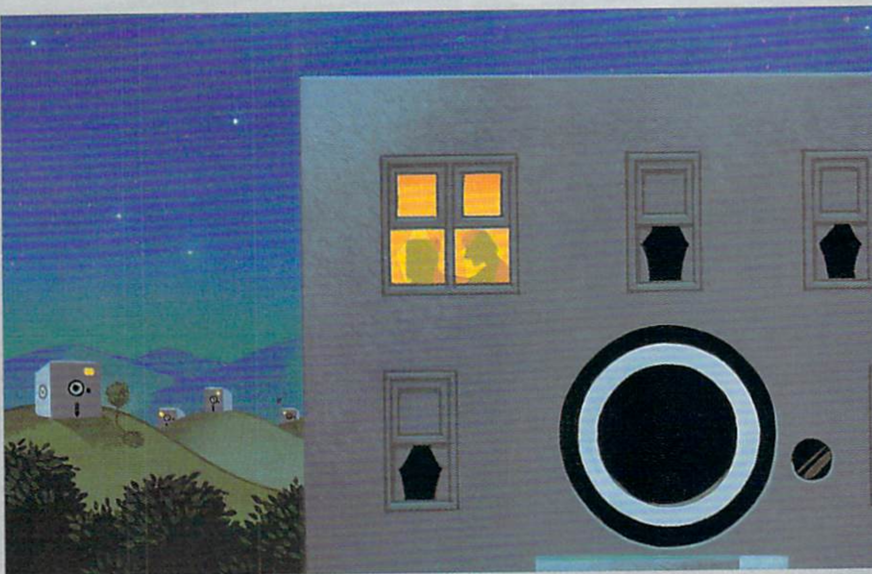
Each programmer insists he doesn't view programming as a job, but instead a labor of love. All admit they wrestled with times of frustration when coding obstacles slowed them and each has resented the irritations of having to contend with the demands of the business side of marketing and selling their products. But each was drawn to the profession not in quest of financial rewards, but simply because he loved computers and the pleasures of working with them. Here are their stories:

***How and why did you get involved with computers?***

**Brian Fargo:** "I was still in high school when my father brought home the first computer. And as you can guess, I fell in love. I became a computer junkie. I'd wake up in the morning and sit at the thing until after midnight. All I know about them is self-taught. I bought every book I could find about computers and simply put

PAUL REOTT


REOTT



"I like to see a project through from beginning to end . . . that's a full year of 16-hour days just eating, breathing, living and sleeping that project."

hours and hours of hands-on experience into it. That's how I learned my craft. I'm 24, and working on computers is all I've ever done. I worked in a ComputerLand store helping repair computers. While doing that I started a software company called Sabre Software where I did everything —programmed, manufactured, drew the artwork and distributed the software. So computers have been my life."

**Edward Fletcher:** "I've been interested in electronics since the early '70's so I decided to go to engineering school to become an electrical engineer. While in school, I took a FORTRAN course which was required of all engineers. I loved it. Later, I moved in with a roommate who had one of the early self-built personal computers and I taught myself BASIC. I started writing simple games using that computer. In 1980, my sister and I split the expense of buying a computer so I had one close by on which I could practice BASIC. I continued writing simple adventure games.

"These early experiences began my dream to create a game of marketable quality. While still in school I worked with a company which designed digital equipment, and I continued with them after I graduated. But I've only been programming professionally about two years. Until then I had primarily been writing debugging utilities for the digital hardware I was developing — nothing very serious."

**Bob Lentini:** "I was an audio engineer before I got interested in computers. I worked with some of the major stars like Paul Anka, Tony Orlando, Diana Ross and people like that. That kind of job requires that you spend many days in hotels, buses, etc. That was fine when I was 20, but I'm 37 now, and I know there is more to life than sitting in a motel room. I became very disillusioned with my position in the audio industry. I began looking for something else to occupy my time. The Sincliar ZX81 hit the market, the little computer from England. The size and price was right so I picked one up just to occupy my time. The needle was in. In two weeks of playing with that little computer I was hooked.

"I expanded it to 64K and carried that computer around in a briefcase and learned and learned and learned. After two weeks of programming with BASIC, I realized that BASIC wasn't the answer. On that computer it was notoriously slow mainly because of the way it handled the video. That forced me into Z80 machine language. Within months I was doing some pretty decent Z80 routines with that machine. So I was totally self-taught. I just bought some books, got into the thing and went at it. I was forced by that computer to learn machine language.

"I continued on the road for another year, practicing on my computer in between working my audio job. You have to understand that I was making a very good living as an audio engineer. I was one of the top paid engineers out there. When I came to the decision to quit that job to become a full-time programmer it was very difficult. But I had a love for computer programming and I saw a lot more potential in that than going from hotel to hotel and pushing buttons for the stars."

***Tell us how you became a professional programmer and what you are doing now.***

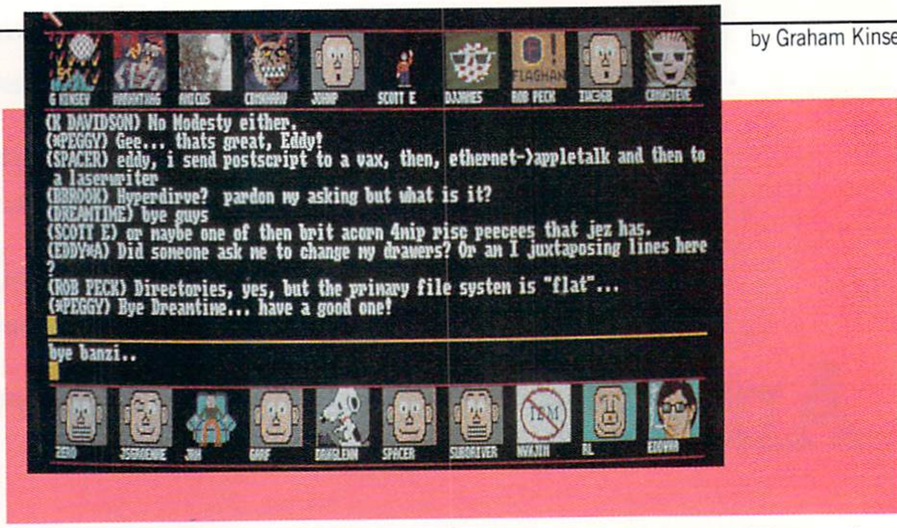
**Brian Fargo:** "I really don't program anymore. I'm really sort of a director here at Interplay. We have a graphic artist here, a guy who is an expert with sound, we have a programmer who is the main guy. We have a designer who adds the real meat to our products. The programmer provides the skeleton of the product, so to speak, and the designer fills it out. We have writers because we need well-written text for our games. I sort of collaborate all of these individual talents into the final product. Interplay is my company so I get to do the more mundane things required to run a company, but 80% of my time is spent creating software. My background in software makes my job a lot easier. The company has been around for nearly four years and everyone here is under 30."

**Edward Fletcher:** "A friend, Chris Weaver and I formed a company called Bethesda Softworks. The plan was to design a game for the Amiga. We concentrated on keeping the overhead as low as possible. I did some consulting and contracting work for some engineering companies in the area to keep us alive and money flowing into the company. When I could find time, I was working on *Gridiron!* as much as possible. I did the majority of the game in an intense six-month period. Although programming is my primary job, I do spend part of my time working on hardware. And I like that. Being able to switch between the two keeps me from getting into a rut. So far our only program for the Amiga is *Gridiron!* which is selling pretty well. We are now porting it over to other systems. About 80 to 90 percent of the program is written in Lattice C and the real critical timing stuff was done in assembly language."

"I can't punch in at nine in the morning and quit at five and be creative just during those hours."

**Bob Lentini:** "I'm a programmer. I live in Las Vegas and work for a company on the east coast. I'm using company-supplied equipment that is incredible — hard disk, etc. I'm no longer programming on the Commodore line of computers although it

*Continued on pg. 118*




by Graham Kinsey

# Amiga Public Domain Update

This month the number of new Amiga Public Domain programs are much fewer than last month, but there are still some good ones. Not including the new graphics demos, the best program this month is Journal, which allows you to record and play back almost any Amiga session.

Before we get to reviewing this month's programs, I would like to inform all Amiga users who have obtained Fish disks 80 and 88 that Fred Fish has recalled these disks. Fred has found that these two disks accidentally included copyrighted commercial programs that should not have appeared on any public domain disk. Fred asks all Amiga users who have these disks to destroy their data contents by re-formatting these disks. Fred has stated that all *public domain* programs that appeared on these two disks will reappear again on new Fish disks.

I have reviewed three PD programs from Fish Disk 88, noting that these programs were formerly on Fish Disk 88, since that disk should no longer exist in any Amiga user's public domain library. Each program reviewed lists the author, whether that PD program is available on the Fish or AMICUS series and the number of each series. When a public domain program has been classified as shareware, this is also mentioned, with the suggested amount.

**Keylock:** by Andry Rachmat (Fish 81)

If you have children, pets, or other people who like to bang on your keyboard while you're away, here's a little program that will prevent access to your Amiga by unauthorized users. Keylock will lock the keyboard and the mouse until you type in a password. Unfortunately, the only way to change the default password, "password", is to edit the program itself with a binary file editor.

**Scat:** by Stephen Pietrowicz (Fish 81)

Another graphics display hack, Scat is a variant of Leo Schwab's Ing program. Scat effectively gives your pointer bad breath!

**Rocket:** by Peter da Silva (Fish 82)

If you ever get bored while using your Amiga (if such a thing could happen), here's a little game that will fit nicely on the Workbench or CLI screen. The object here is to land a tiny spaceship on top of one title bar, but under another closely placed title bar. The cursor keys are used for propulsion control. You can move the location of the title bars, to make the game as easy or as hard as you want.

**Adventure:** by David Platt, Ken Wellsch, and Dave Haynie (Fish 82)

Here is the text adventure game that started it all, Adventure. This is an expanded version of the original. This Adventure will speak as well as print information. This program has the odd feature that it will run on a 256K Amiga (does anybody still have such a beast?).

**Viacom:** by Leo Schwab (Fish 82)

Here's another display hack by the master himself, Leo "Bols Ewhac" Schwab. This hack is a political statement about Viacom, a cable TV service in the San Francisco area.

**Hide:** by Francois Rouaix (Fish 85)

If you have extended memory and want to run nasty programs that don't differentiate between FAST and CHIP memory, Hide will force all programs to allocate CHIP memory only.

**Imagetools:** by Stephen Vermeulen (Fish 85; Shareware: $20)

Here are a set of tools (supplied as several separate programs) for manipulation of IFF pictures and icons. Among these tools are programs that perform histograms, converting icons to IFF brushes, re-colorizing an IFF picture with a new palette (for a second picture), shrinking a picture, and comparing to different color palettes.

**LowMem:** by Perry Kivolowitz and ASDG Inc. (Fish 85)

LowMem is a low memory server. If LowMem finds out that a program is unable to obtain required memory (an AllocMem call fails), LowMem will send a message to all programs that are currently running to give up any memory that they really don't need. Programs that are written properly will then give up any non-essential allocated memory to the system memory pool.

**AutoPoint:** by Jude Katsch (Fish 86)

AutoPoint is a nice utility program that serves two purposes. The first is that AutoPoint, like SunMouse, alters the mouse pointer so that whatever window the pointer is currently within is the active window. But unlike SunMouse, AutoPoint will also automatically bring that window to the front of the screen as soon as you move the pointer on top of it. AutoPoint's other purpose is to act as a screen-saver. Unlike most screen-saver programs, AutoPoint's blank screen isn't totally blank, for the Amiga checkmark symbol will appear and move around the screen.

**ClickToFront:** by Bryce Nesbitt (Fish 86)

This program adds one new function to the Amiga mouse. If you double-click on any window, that window is brought to the front of the screen.

**MemWatch:** by John Toebes (Fish 87)

If you are a programmer, MemWatch can help you in debugging. If MemWatch detects that a program that is running is attempting to write to the lowest 100 bytes of memory in the Amiga system memory map, it will inform you of this fact. You then have the option of allowing

*Continued on pg. 90*

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*Continued from pg. 88*

this to happen or allowing MemWatch to prevent the write from potentially trashing low memory.

**MovePointer and MoveWindow:** by "CEWY" (Fish 87)

Here are two little utilities that allow CLI users to simulate mouse movements from the keyboard. MovePointer lets you move the mouse pointer to any area of the screen. MoveWindow allows you to drag and resize any Intuition window.

**PalTest:** by Chrisof Bonnkirch (Fish 87)

If you want to make sure that the program you are writing will work correctly on Amigas outside the U.S. using PAL displays (as opposed to NTSC), here is a program that can tell your program which television standard the user is running under. PalTest will also tell your program if the user has a Genlock hooked up to their Amiga.

**WarpText:** by Bill Kelly (Fish 87)

For programmers who want to speed up text display in their programs, here is a routine that can be added into you program. The author claims that WarpText can display text at 13,500 characters per second.

**DirMaster:** by Greg Peters (formerly on Fish 88; Shareware: $25)

DirMaster is a disk cataloging program. DirMaster will display disks, directories, individual files, or all three. Many of the sorting and other options in this program are ghosted, forcing you to send in the shareware check.

**FuncKey:** by Anson Mah (formerly on Fish 88; Shareware: $5)

Here is a simple yet versatile macro editor. Unlike most programs that employ macros, which only allow for a normal set and a shifted set, FuncKey also allows you to have sets that are activated by the ALT key, and sets for each of the two Amiga keys. All macros can be saved as a file, with or without an icon associated with the macro file. FuncKey can be moved to the background and called up at any time.

**ScreenShift:** by Anson Mah (formerly on Fish 88)

This program is almost identical to ScnSize, which allows you to instantly reposition the Amiga display on your monitor. The big difference is that ScreenShift displays a window and gadget just like the window and gadget in the Preferences program that are supplied for screen re-positioning.

**Journal:** by David Cervone

Journal is a unique and potentially very important program. Journal allows you to record any Amiga session and then play it back later. Not only will Journal record all normal keyboard character input, but it also records when a special key is pressed, like SHIFT, ALT, ESC, or either of the Amiga keys. Journal will also record all mouse input, both mouse movement and button presses. Recorded session files can become quite large, so be careful about where the Journal file is being saved to. At the moment, Journal will not record input from the second game port, nor from the serial or parallel ports. Journal could have a wide range of uses for demos, tutorial sessions, and program bug reporting, for example.

**El Gato:** by Kevin Sullivan

Here is a stunning animation demo. El Gato was done by the common graphics technique of page flipping. But what isn't common at all is that El Gato is made up of over 70 different IFF pictures. These pictures, when uncompressed, took up over 800K of data. By storing the entire demo in the new IFF form ANIM, El Gato was compressed down to about half its original size. The result of all this is a view of a cat walking, while contained in a frame that is constantly rotating. The rotation gives a great 3D effect. Although El Gato's colors aren't very impressive, the net animation result certainly is among the best of any Amiga demo I have ever seen (easily surpassing Juggler on animation). If you see the file on a BBS or online service, beware that the archived file takes up a huge 330K of data.

**Probe:**

Here is a long graphics demo of *The Director,* an animation package for the Amiga. This demo is based on a TV show about searching for extra-terrestrial life. Although this demo doesn't boggle your eyes like the Juggler and El Gato, it runs for over six minutes. The net presentation is very nice and is worth seeing. If you thought El Gato was large, Probe's data files are broken up into three parts, and the total size is over 550K. Since Probe takes up almost a full disk, the files were first combined with the program Tracker, which reads data as entire tracks. You must have Tracker in order to be able to put together the Probe demo.

Next month expect more of the best in new Amiga public domain programs. Of course, there will also be many other new programs that are fresh off the Amiga bulletin boards and on-line services in next month's column. As always, I can be reached in the Amiga Zone on PeopleLink (ID: G KINSEY), or on the IDCMP BBS (617-769-8444, 8pm-8am). If you have written a public domain/shareware/user-supported program or have obtained one that you think is worth mentioning to all Amiga owners, then please attempt to contact me. See you next month. C

## The Amiga Conference

The ability to talk to many people from all over the country and beyond, simultaneously via on-line conferencing is a popular pastime and a common occurrence on on-line services. But when you're using an Amiga for teleconferencing, it seems a shame to waste the graphics power of the Amiga, when it could be used to enhance a teleconference. Fortunately, the Amiga's impressive graphics need no longer lie dormant while you're chatting with other people. PeopleLink's Amiga Zone is now running The Amiga COnference (ACO for short), which was written by one of the Zone's assistant conference chairman, Steve Pietrowicz (ID: CBM*STEVE).

When you first boot up ACO you will see the screen for the Communicator version 1.34, the great public domain terminal program by Dan (DJ) James. (I reviewed version 1.32 in the July installment of my Amiga Public Domain column here in *Commodore Magazine.* Improvements in version 1.34 of the Communicator include an improved file requester, plus the option to pull down the Communicator screen.) The Communicator is used as the base program for ACO. Therefore you don't need another terminal program when you're not in conference while running ACO. Select the ACO menu option from the Communicator's menu. The ACO screen will then appear with two rows of empty chairs on the top and bottom and a big gap in the middle. The gap in the middle of the ACO screen is used for text display, so that you can still see what people are saying. There is also a two-line section just below the area for text that allows you to see what you are typing, before it is sent.

When you enter an ongoing conference, the chairs will be filled up with the attendees' "faces." When you look at the ACO menu set, you'll see face commands. If you

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*Continued from pg. 90*

select one, a face will also show up for you, with your PeopleLink ID underneath! ACO has five built-in faces. Each one has a different expression, so you can change your expression to fit your mood. There are also different sets of built-in faces for each gender.

ACO also allows you to design custom faces with any Amiga paint program or FaceEd, the supplied painting program expressly made for designing custom faces for ACO. ACO faces can have up to 16 colors and are shown in the Amiga's medium resolution, 640X200 pixels. The display capabilities in the ACO's graphics mode allow you to design some pretty impressive faces, even though the faces themselves are small (50X25 pixels).

When you are done designing your custom faces, you then upload them to the Amiga Zone on PeopleLink. When your faces are added to the latest installment of the ACO face library, you will be able to use them the next time you use ACO. Many of these are rather creative. There are faces depicting cartoon characters, demons, wizards, clowns, aliens, flags, and even sayings and abstract paintings! I have even seen a couple of users perform simple animation with their custom faces, by designing two or more faces as frames, and flipping through each frame.

There is more to ACO than just faces. One cute feature is the Boing option. If you select this menu option, you will send a little red and white you-know-what to everyone else in the conference. If you don't want to be distracted by these objects, use the Disable Boing option, which will prevent Boing commands being sent by others from distracting you. There is also a Clear Face command, which will wipe out all ACO faces currently filling the chairs. There are also a couple of useful PeopleLink commands that are available as options, including a command to show the current time and to show you which people are currently in conference. There is also a handy option from within the Communicator portion of ACO. If you decide you don't want to use ACO, and just participate in conference normally, you can turn on the Mask Commands option from the Communicator screen. This will filter all the special ACO commands other people are using from showing up on your screen.

I talked to Steve Pietrowicz about what's in ACO's future. Steve told me the next major addition to ACO will be audio capabilities. Steve will add speech capabilities, and he might even add digitized sound capabilities. Steve is also contemplating adding more graphical shapes besides the Boing ball for people to bounce all over each others' screens. He also plans to add a "least/most recently used" algorithm that will remove faces of people who left the conference, so that they won't be occupying chairs on your screen if they aren't actually in conference any more. Steve is considering allowing people to have more than five custom faces at a time, although this will depend largely on just how big the ACO face libraries become (The first edition of the ACO library contained over 150 different custom faces, and I won't be surprised if this grows to at least 700 faces by December.) Steve told me that the ACO face libraries will be broken up into parts when there are a lot of faces in the library (since downloading a 300K archived file can be a real pain). He also said that you can even keep the ACO face library pieces in different places (for example, keep one or two pieces in RAM for fast access, and the rest on disk). Steve plans to allow PeopleLink ID's that will be used by more than one person (like corporate ID's) to have more than one set of custom faces.

Currently ACO will not appear as part of any Amiga commercial terminal program. This will allow Steve to retain total control of the quality of ACO, without worrying about when some third party will get around to updating their terminal program so that the latest ACO routines can be added. Steve will also be adding a Record/Playback option, which will allow you to record an ACO session, and then let you dazzle your friends again with your Amiga.

ACO is a fun and entertaining program, bringing the Amiga's graphics power to the often mundane world of on-line conferencing. And PeopleLink's low rate of $4.95 @ 1200 baud allows you to enjoy yourself instead of worrying about the bill. And don't forget that the AmigaZone's main conference on Sunday night averages in attendance from fifty to over eighty people at once, which will give you plenty of people to talk to and faces to see! Once you try an ACO conference, I'm sure you'll never want to leave.

## Tips & Tricks/Amiga

*Continued from pg. 18*

### Single Drive Copy Solution

For those who may still be operating with the single internal Amiga disk drive, here's something that cuts down on the number of disk swaps during a file copy. Since the Amiga reads in 512 bytes, then makes you swap disks to write that same 512 bytes back out, I find it simpler to copy the original file to RAM: then swap disks and copy the file from RAM: to the new disk. This works in both the Workbench and CLI environments and cuts the number of disk swaps to ONE!

*Brian Justis*
*Cleveland, OH*

### AddBuffer Woes (or the Case of the Early Disk Eject)

Since acquiring my first major chunk of RAM expansion, I've started setting up *huge* (50 block) buffers for my floppy drives with the AddBuffers command. Usually, this gives me an increased throughput while operating from a floppy environment. Recently, however, I've seen how an overly generous buffer size can cause severe headaches. In an attempt to ensure the stability of my work, I have started writing my articles out onto floppies instead of my hard drive due to hardware problems. Once during my last AmigaBASIC tutorial session (I write them with an editor), I was storing the file, and when the drive light went out I ejected the disk. Well, I was quite surprised when the drive light flickered back to life while I held the disk in my hand just outside of the drive opening. I waited until the light went out and reinserted the disk. It wasn't long before I was greeted with the infamous "ERROR VALIDATING ARTICLES" requester. I went through the standard sequence and used DiskDoctor to try and recover it, only to find that my tutorial was history! It seems with buffers that large, the data only gets written out as the buffer area fills. I assume that the final segment of my file was a bit shy of the buffer size, so the system waited until it was sure that all of the WRITEs had been performed before sending that last segment to the disk. Being the impatient person that I am, I saw the light go out and removed the disk. The rest is an embarrassment that I hope you'll never have to live through. The moral: "Be sure the light is out. If you're not, wait a minute!"

*Tim Jones*
*Deltona, FL*

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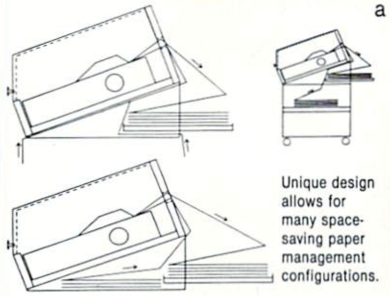
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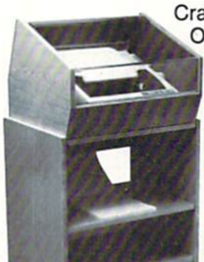
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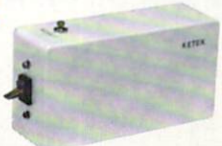


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by Tim Jones

# AmigaBASIC Tutorial

## Sounds

*A short program demonstrates difficult areas of AmigaBASIC, offering both tips on confusing areas and tricks to make your life easier. Rather than an article followed by a program, we have combined them for the sake of clarity.*



ART BAXTER

```
' This time around, we're going to take a look at the
' functions and commands associated with making SOUNDs from
' AmigaBASIC.  We will not be looking at Speech, just ways to
' get tunes and other musical-type sounds.  This installment
' relies heavily on information imparted (hopefully) in
' previous installments.  It also requires that you have the
' files "graphics.bmap" and "intuition.bmap" in the Libs:
' directory of your boot disk (or your current working
' directory).

' First, let's get some of the tedious things out of the way.
' If you will be using any of the SUB routines included here,
' you will need the DIM statements, at least, in your program.

Startup:
  CLS
  DEFINT A-Z
' Set up the Waveform arrays
  DIM SineWave(255),SqWave(255),STooth(255),Tri(255)
' Set up the Note definition Arrays
  DIM C(8),CS(8),D(8),DS(8),E(8),F(8),FS(8)
  DIM G(8),GS(8),A(8),BF(8),B(8)
  Tune = 1 ' Default to Tune 1
  LIBRARY "graphics.library"
  LIBRARY "intuition.library"

' These are calls to the SUB routines that have been built for
' this program.  I used this format to demonstrate how much
' neater a program can be made through the use of SUB routine
' modules for the bulk of the functions involved.  Also, it
' makes it easier for you folks (the readers) to use the
' routines without trying to rewrite the entire program - just
' take the SUB you need, pass the appropriate information and
' run!  Most of them don't require that parameters be passed
' when you call them.  ChangeTitle, on the other hand,
' requires that you pass the new string to be displayed.

  DisplayInit
  TitAdd$ = "Initializing WaveForms"
  ChangeTitle TitAdd$

' This call could have also been made as:

'      CALL ChangeTitle(TitAdd$)

' The only difference being that the CALL requires Parenthesis
' while just using the SUB name doesn't even like them.

  SoundInit
  TitAdd$ = "Initializing Menus"
  ChangeTitle TitAdd$
  MenuInit
  TitAdd$ = "Defining Notes"
  ChangeTitle TitAdd$
  NoteInit
  TitAdd$ = "Ready!"
  ChangeTitle TitAdd$
  Glitter

Main:

' This is where we sit until a MENU event occurs.  By using
' SLEEP, our program is well behaved and doesn't hog the
' processor while waiting for an event.

  WHILE -1
    ON MENU GOSUB HandleMenu : MENU ON
    SLEEP
  WEND

HandleMenu:

' Refer to installment #2 for more information on MENU
' commands and structures.

  MenuNum = MENU(0) : MenuItem = MENU(1)
  IF MenuNum = 1 AND MenuItem = 2 THEN
    Cleanup
  ELSEIF MenuNum = 1 AND MenuItem = 1 THEN
    IF Tune = 1 THEN CALL StarTrek
    IF Tune = 2 THEN CALL Glitter
  ELSEIF MenuNum = 2 THEN
    CheckSelect
  ELSEIF MenuNum = 3 THEN
    IF MenuItem = 1 THEN
      Tune = 1
      REM $IGNORE ON
      MENU 3,0,1,"Voices"
      REM $IGNORE OFF
        MENU 3,1,2,"  Single "
        MENU 3,2,1,"  Multi  "
    ELSEIF MenuItem = 2 THEN
      Tune = 2
      REM $IGNORE ON
      MENU 3,0,1,"Voices"
      REM $IGNORE OFF
        MENU 3,1,1,"  Single "
        MENU 3,2,2,"  Multi  "
    END IF
  END IF
  RETURN

' Cleanup simply closes down our custom screen and window,
' returns the BASIC output window, closes the libraries and
' resets the original menus.  The REM statements are included
' for those of you that may be using the AbSoft AC/BASIC
' compiler.

SUB Cleanup STATIC
  WINDOW CLOSE 1 : SCREEN CLOSE 2
  LIBRARY CLOSE
  REM $IGNORE ON
  WINDOW 1,"BASIC",(0,0)-(617,186),31,-1
  MENU RESET
  REM $IGNORE OFF
  END
END SUB

SUB DisplayInit STATIC
SHARED Rp&,Wp&,Title$

' We set our display parameters here.  We will use 2 variables
' specifically for the sake of changing the title of our
' window to inform the user as to what is going on - Title$
' and TitAdd$.  The screen is a 640 X 200 screen, 4 bitplanes
' deep allowing the use of 16 colors.  The variables Rp& and
' Wp& are used by the graphics and intuition calls we will be
' making, therefore they must be listed as SHARED (along with
' Title$).  TitAdd$ isn't SHARED because we pass it directly
' to the SUB when we call it and we declare it in the SUB's
' name.

  Title$ = "Sound's Great! AmigaBASIC SOUND Tutorial "
  TitAdd$ = " Initializing Display"
  SCREEN 2,640,200,4,2
  WINDOW 1,Title$ + TitAdd$,(0,0)-(631,186),0,2
  Rp& = WINDOW(8) : Wp& = WINDOW(7)
  PALETTE 0,0,0,0          ' I Like black screens!
  PALETTE 1,.5,.5,.5   ' Grey for the default text
  COLOR 7

' I am using Move& and Draw& from the graphics.library to
' demonstrate the difference between them and the LINE
' function.  The SYNTAX for Move& is:
'      Move& Rp&,X,Y
' Where Rp& is the Rastport address (WINDOW(8)) of our window
' and X and Y are the x and y pixel coordinates that we wish to
' move to.  (These are just to put something more on the screen,
' you can leave them out if you like.)

  FOR x& = 153 TO 165 STEP 3
    Move& Rp&,0,x&
    Draw& Rp&,640,x&
  NEXT x&
  LINE(40,10)-(305,78),5,B ' Easier than PolyDraw&
  LINE(40,44)-(305,44),5
  LINE(40,80)-(40,83),7
  LINE(305,80)-(305,83),7
  COLOR 13

' By using Move& here, we can place the text anywhere we
' want on the screen.  Just remember that the pixel that you
```

*Continued on pg. 96*

*Attention*

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*Continued from pg. 94*

```
' MOVE to is the lower left corner of your first letter.  If
' you want more speed, you could use Text& to place your
' message rather than PRINT.
' The SYNTAX for Text& is:
'        Text& Rp&,Pointer,Length
' Where Rp& is the Rastport address, pointer is the address of
' our text string and length is the number of characters in
' the text.  Note that Text& does not require that the text be
' terminated with a NULL character since we are telling it how
' many characters.

  Move& Rp&,5,13 : PRINT "+127"
  Move& Rp&,27,47 : PRINT "Ø"
  Move& Rp&,5,81 : PRINT "-128"
  Move& Rp&,36,91 : PRINT "Ø"
  Move& Rp&,293,91 : PRINT "255"
  COLOR 3
  Move& Rp&,115,88 : PRINT "Waveform Graph"
  LINE(44,96)-(288,143),1Ø,BF
  LINE(5Ø,93)-(295,14Ø),3,BF
  COLOR 1Ø,3
  Move& Rp&,99,1Ø4
  Text& Rp&,SADD("Horiz Scale is 1:1"),18
  Move& Rp&,87,112
  Text& Rp&,SADD("Vertical Scale is 4:1"),21
  Move& Rp&,83,126
  Text& Rp&,SADD("Use Menus for Waveform"),22
  Move& Rp&,131,134
  Text& Rp&,SADD("Selection"),9
  COLOR 1Ø,Ø
END SUB

SUB SoundInit STATIC
SHARED SineWave(),SqWave(),STooth(),Tri(),Rp&

' We have DIM'd a set of arrays for use in defining our
' waveforms (the WAVE function).  We must declare them as
' SHARED so that ALL of our SUB's can use them.  The waveforms
' that I set up here are based on simple formulas.  You can
' create your own, just keep in mind that each WAVEform is
' defined by an array of 255 entries with values between 127
' and -128.  Also, the higher the value (in either direction)
' of an entry, the louder the output.  I have chosen values to
' push these limits.  You could choose to lower them if you
' are using only your monitor speaker.

Default:
  ' This is the quickest way to set up a SINE Waveform
  FOR Count = Ø TO 3
    WAVE Count,SIN
  NEXT Count

SineWave:
  FOR Pt = Ø TO 255
    SineWave(Pt) = 127*SIN(Pt*3.1416/128)
  NEXT Pt

' We will actually use the values in our arrays to plot the
' waveforms in the display window.  We will use a 1 to 1
' aspect for the horizontal axis and a 4 to 1 aspect for the
' vertical due to display limitations.

  FOR x = Ø TO 255
    IF SineWave(x) < Ø THEN
      PSET(x+43,(SineWave(x)+(2*ABS(SineWave(x))))/4+44),9
    ELSE
      PSET(x+43,(128-SineWave(x))/4+12),9
    END IF
  NEXT x

' Now we'll identify the displayed waveform

  Move& Rp&,31Ø,47
  PRINT SPACE$(2Ø);
  Move& Rp&,31Ø,47
  PRINT "Sine Wave"

' All of the Waveform changes made below will follow these
' guidelines with the exception of the square wave.  I had to
' add a LINE command to join the upper and lower waveform
' segments.  This is just for display purposes, however.

' Let's predefine the waveforms we'll be using

SquareWave:
  FOR Pt = Ø TO 127
    SqWave(Pt) = 127
  NEXT Pt
  FOR Pt = 128 TO 255
    SqWave(Pt) = -128
  NEXT Pt

SawTooth:
  Vert = -128
  FOR Pt = Ø TO 255
    STooth(Pt) = Vert
    Vert = Vert + 1
  NEXT Pt

Triangle:
  Vert = 127
  FOR Pt = Ø TO 127
    Tri(Pt) = Vert
    Vert = Vert - 2
  NEXT Pt
  Vert = -128
  FOR Pt = 128 TO 255
    Tri(Pt) = Vert
    Vert = Vert + 2
  NEXT Pt

END SUB

SUB MenuInit STATIC

' Initialize the MENU structures

  MENU 1,Ø,1,"Project"
    MENU 1,1,1,"Play   "
    MENU 1,2,1,"Quit   "
  MENU 2,Ø,1,"WaveForms"
    MENU 2,1,2,"   Sine      "
    MENU 2,2,1,"   Square    "
    MENU 2,3,1,"   Sawtooth "
    MENU 2,4,1,"   Triangle "
  MENU 3,Ø,1,"Voices"
    MENU 3,1,2,"   Single "
    MENU 3,2,1,"   Multi  "
  REM $IGNORE ON
  MENU 4,Ø,1,""
  REM $IGNORE OFF
END SUB

SUB NoteInit STATIC
SHARED C(),CS(),D(),DS(),E(),F(),FS()
SHARED G(),GS(),A(),BF(),B()

' We will use the values for the lowest notes (whole octave,
' that is) to define our initial notes and then use simple
' multiplication to define the next 7 octaves.  This is done
' because each note is double the frequency of the same note
' in the previous octave.  Therefore, by multiplying the
' frequency of D2 by 2, we get the frequency of D3.  The note
' naming convention used is Notename(Octave).  All of the
' notes are listed with natural and sharped identities with
' the exception of A sharp/B flat.  I use 'S' to indicate a
' sharp, but AS is considered a keyword, so I use BF (B flat)
' to identify that particular note.  I won't begin to try and
' teach music theory here, except to say that any note's sharp
' value is the same as the next note's flat value (A sharp = B
' flat, C sharp = D flat, etc.).

  READ C(1),CS(1),D(1),DS(1),E(1),F(1),FS(1)
  READ G(1),GS(1),A(1),BF(1),B(1)

  FOR Octave = 2 TO 8
    C(Octave) = C(Octave-1)*2
    CS(Octave) = CS(Octave-1)*2
    D(Octave) = D(Octave-1)*2
    E(Octave) = E(Octave-1)*2
    F(Octave) = F(Octave-1)*2
    FS(Octave) = FS(Octave-1)*2
    G(Octave) = G(Octave-1)*2
    GS(Octave) = GS(Octave-1)*2
    A(Octave) = A(Octave-1)*2
    BF(Octave) = BF(Octave-1)*2
    B(Octave) = B(Octave-1)*2
  NEXT Octave

NoteData:

' These values were taken by dividing the values shown in the
' AmigaBASIC manual (page 8-139) by 4 to reduce the values
' (for octave 3) to the level required for octave 1.

  DATA 32.7Ø3, 34.648, 36.7Ø8, 38.891, 41.2Ø3, 43.654
  DATA 46.249, 48.999, 51.913, 55, 58.27Ø, 61.735

END SUB

SUB CheckSelect STATIC
SHARED MenuItem,SineWave(),SqWave(),STooth(),Tri(),Rp&

' We call this SUB every time a selection is made from MENU 2.
' I assign the same waveform to each channel for simplicity
' sake.  There is no reason why I couldn't have assigned a
' different waveform to each channel.  We set the waveform and
' also reset the checkmark on the menu.

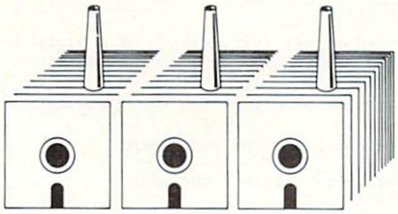
  ON MenuItem GOSUB Si,Sq,St,Tr
  EXIT SUB

' The REM's, once again, are for the AC/BASIC compiler.
' For some reason, AmigaBASIC won't "UNCheck" a menu
' item unless the menu title is specified.  This causes
' some problems with the width of the menu titles when
' used with the interpreter sees a new title definition.
' They aren't required by the compiler, however.

Si:
  REM $IGNORE ON
  MENU 2,Ø,1,"WaveForms"
  REM $IGNORE OFF
    MENU 2,1,2,"   Sine     "
    MENU 2,2,1,"   Square   "
    MENU 2,3,1,"   Sawtooth"
    MENU 2,4,1,"   Triangle"
  FOR Count = Ø TO 3
    WAVE Count,SineWave
  NEXT Count
```

*Continued on pg. 98*

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*Continued from pg. 96*

```
  LINE(41,11)-(304,77),0,BF
  LINE(40,44)-(305,44),5
  FOR x = 0 TO 255
    IF SineWave(x) < 0 THEN
      PSET(x+43,(SineWave(x)+(2*ABS(SineWave(x))))/4+44),9
    ELSE
      PSET(x+43,(128-SineWave(x))/4+12),9
    END IF
  NEXT x
  Move& Rp&,310,47
  PRINT SPACE$(20);
  Move& Rp&,310,47
  PRINT "Sine Wave"
  RETURN

Sq:
  REM $IGNORE ON
  MENU 2,0,1,"WaveForms"
  REM $IGNORE OFF
    MENU 2,1,1,"    Sine    "
    MENU 2,2,2,"    Square  "
    MENU 2,3,1,"    Sawtooth"
    MENU 2,4,1,"    Triangle"
  FOR Count = 0 TO 3
    WAVE Count,SqWave
  NEXT Count
  LINE(41,11)-(304,77),0,BF
  LINE(40,44)-(305,44),5
  FOR x = 0 TO 255
    IF SqWave(x) < 0 THEN
      PSET(x+43,(SqWave(x)+(2*ABS(SqWave(x))))/4+44),9
    ELSE
      PSET(x+43,(128-SqWave(x))/4+12),9
    END IF
  NEXT x
  LINE(170,12)-(171,76),9 ' This is where I cheated!
  Move& Rp&,310,47

  PRINT SPACE$(20);
  Move& Rp&,310,47
  PRINT "Square Wave"
  RETURN

St:
  REM $IGNORE ON
  MENU 2,0,1,"WaveForms"
  REM $IGNORE OFF
    MENU 2,1,1,"    Sine    "
    MENU 2,2,1,"    Square  "
    MENU 2,3,2,"    Sawtooth"
    MENU 2,4,1,"    Triangle"
  FOR Count = 0 TO 3
    WAVE Count,STooth
  NEXT Count
  LINE(41,11)-(304,77),0,BF
  LINE(40,44)-(305,44),5
  FOR x = 0 TO 255
    IF STooth(x) < 0 THEN
      PSET(x+43,(STooth(x)+(2*ABS(STooth(x))))/4+44),9
    ELSE
      PSET(x+43,(128-STooth(x))/4+12),9
    END IF
  NEXT x
  Move& Rp&,310,47
  PRINT SPACE$(20);
  Move& Rp&,310,47
  PRINT "Sawtooth Wave"
  RETURN

Tr:
  REM $IGNORE ON
  MENU 2,0,1,"WaveForms"
  REM $IGNORE OFF
    MENU 2,1,1,"    Sine    "
    MENU 2,2,1,"    Square  "
    MENU 2,3,1,"    Sawtooth"
    MENU 2,4,2,"    Triangle"
  FOR Count = 0 TO 3
    WAVE Count,Tri
  NEXT Count
  LINE(41,11)-(304,77),0,BF
  LINE(40,44)-(305,44),5
  FOR x = 0 TO 255
    IF Tri(x) < 0 THEN
      PSET(x+43,(Tri(x)+(2*ABS(Tri(x))))/4+44),9
    ELSE
      PSET(x+43,(128-Tri(x))/4+12),9
    END IF
  NEXT x
  Move& Rp&,310,47
  PRINT SPACE$(20);
  Move& Rp&,310,47
  PRINT "Triangle Wave"
  RETURN
END SUB

SUB ChangeTitle(NewStr$) STATIC
SHARED Title$,Wp&

' We concatenate the existing Title$ with a separation string
' of 2 spaces the additional text and a NULL character.  Next,
' we call the intuition function SetWindowTitles&.  The SYNTAX
' is:

'     SetWindowTitles& Wp&,Window,Screen

' Where Wp& is the window structure address (WINDOW(7)),
' Window is a pointer to the Window title string and Screen is
' a pointer to the Screen title string.  These strings must be
' terminated with a NULL character.  If no string is
' specified, then you must pass a -1.

  NewTitle$ = Title$ + SPACE$(2) + NewStr$ + CHR$(0)
  SetWindowTitles& Wp&,SADD(NewTitle$),-1

END SUB

' The following SUB's are the songs that we use to demonstrate
' the voicing and the sounds created with the waveforms that
' we have made.  Glitter is the first four measures of Stevie
' Nicks' song "After the Glitter Fades".  It demonstrates the
' use of multiple voicings and the use of the SOUND WAIT and
' SOUND RESUME statements.  StarTrek is the opening notes to
' the theme from the Star Trek TV show.  It is a
' straightforward example of how the SOUND function queues
' entries and plays them in order.  I will explain each
' section as we get into them.

SUB Glitter STATIC
SHARED C(),CS(),D(),DS(),E(),F(),FS()
SHARED G(),GS(),A(),BF(),B()

' The variable W is used to set the duration of a whole note.
' Each lower value note is then based on a division factor:

'  W = Whole note
'  W/2 = Half note
'  W/4 = Quarter note
'  W/4.66667 = Quarter note Triplet (one note)
'  W/8 = Eighth note
'  W/10.33333 = Eighth note Triplet (one note)
'  W/16 = Sixteenth note
'  etc.

W = 40

' The SYNTAX for the SOUND FUNCTION is:

'     SOUND frequency,duration,volume,channel

' Where frequency is the frequency of the note in Hz, duration
' is the duration of the note (based on 18.2 being 1 second),
' volume is the note's volume between 0 and 255; 127 is the
' default and channel is the channel (0-3) that the note is to
' be played on.  If you are hooked up in stereo, you will find
' channels 0 and 2 coming from the left speaker and 1 and 3
' coming from the right.  In the following entries, I haven't
' selected a particular channel for any purpose, I'm just
' showing the use of four voices and synchronized output.

' In The first two measures, I have jumbled up the notes in no
' particular order (except for the fact that the notes on the
' same channel are in sequence), while in the last two, I have
' entered the full measure for each voice.  In either case,
' the SOUND FUNCTION will queue all of the entries and play
' them as it comes to them.

' The SOUND WAIT and SOUND RESUME statements are placed here
' mainly to act as measure separators.  SOUND WAIT forces ALL
' SOUND output to wait for the matching SOUND RESUME.  This is
' helpful if you are trying to coordinate sound output with
' other BASIC functions.

FirstMeasure:

' Force output to wait until all sounds are queued
SOUND WAIT

SOUND FS(5),W/2,64,0
SOUND D(3),W/2,64,2
SOUND D(5),W/8,100,1
SOUND A(4),W/8,100,1
SOUND D(5),W/8,100,1
SOUND E(5),W/4,100,1
SOUND D(3),W/4,80,2
SOUND FS(5),W/2,0,0
SOUND FS(5),W/8,100,1
SOUND A(4),W/8,100,1
SOUND B(4),W/8,100,1
SOUND FS(3),W/8,80,2
SOUND E(3),W/8,80,2

' Now play the notes as they are queued
SOUND RESUME

SecondMeasure:

SOUND WAIT

SOUND G(5),W/2+W/8,80,0
SOUND D(5),W/2+W/8,100,1
SOUND B(4),W/2+W/8,80,3
SOUND E(3),W/2,80,2
SOUND G(5),W/4+W/8,0,0
SOUND B(4),W/4+W/8,0,3
SOUND B(4),W/8,100,1
SOUND E(5),W/4,100,1
SOUND E(4),W/4,80,2
SOUND B(3),W/8,80,2
SOUND A(3),W/8,80,2
```

*Continued on pg. 123*

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by Thomas Hayes

# Cross-Search

*For the Commodore 64*

Cross-Search got its name from two other famous games you may be familiar with: "crossword" and "word search." Cross-Search includes all the difficulty in answering the questions of a crossword puzzle along with the challenge and fun of a word search puzzle.

As the game begins the top of the screen will be filled with seemingly random letters. They are really the answers to the questions that will be asked at the bottom of the screen. The questions are in the format of the questions asked in crossword puzzles. If you have never played a crossword puzzle then you should be aware that although I refer to "questions" they aren't really worded like questions. All of the questions will be linked in one way or another with computers and or computing.

Along with the questions will be several other informational statements that will assist you in the game. Just under the top portion of the screen will be the number of letters in the answer, the number of words in the answer, and the number of the question itself. A further explanation of these statements is as follows: First, the number of letters in the answer is the number of characters minus any spaces and or any symbols other than the alphabet. It is important to remember when entering your answer that you use only the alphabet and eliminate all spaces. The program won't allow anything but the alphabet. Secondly, the number of words indicates if the answer is one, two, or three words in length. Thirdly, the questions are numbered from one to 53.

Now for the questions themselves. As previously discussed all of the questions are about computers. Some of the questions or parts of the questions are abbreviated. All abbreviations will be inside parentheses. There is one abbreviation you should watch for —(E.M.). (E.M.) is the abbreviation for error messages. When you see this (E.M.) you should remember that the answer will be one of the computer's error messages. Notice that a question in the game will be referred to as the "clue." To give you an idea of what an answer or clue will be, the first clue is "VIC." If you are hoping that I will give you the answer, don't hold your breath. When entered the answer will appear at the bottom of the screen. If after you have answered the clue, it was correct, you will hear several bell sounds to indicate the answer was correct. If the answer was incorrect, you will hear a buzzer and the wrong answer will be erased.

> Cross-Search includes all the difficulty of answering the questions in a crossword puzzle, along with the challenge of a word search puzzle.

At this point you can try again or go on to another question. Press the F1 key to get to the next clue. You can only go in the direction of larger numbered clues. If you wish to get to a lower numbered clue than the one you are looking at now, you will have to continue until the clues wrap around to the beginning.

Now we will discuss the word search portion of the program. Any time you wish to go to this portion of the program just press the F7 key. You do not have to finish answering a clue to press the F7 key. Once you are at this point press the F1 key to return to the first portion of the game. If you do remain at the word search portion of the program, you will notice a flashing cursor at the top left of the screen. With the use of the cursor keys you can position the cursor over any of the letters in the top portion of the screen. Press the space bar with the cursor over a letter and toggle between reverse and normal type. Now that you have a way to mark specific letters you can find the answers to the earlier clues. When you do find an answer, highlight it with reverse type and search for another answer. When you find all of the answers and you have highlighted all of the letters in those answers you will be ready to move on to the last part of this game. As in any other word search puzzle when you have found all the words there will still be letters left. You are then asked to answer a question in which the answer will be comprised of those left-over letters.

After all the words have been found, press the F7 key again. There will be a check to see if all words were, in fact, found. If all were found, then the screen will be cleared. At this time the screen will be filled with several sentences, and you will be informed that there is one more challenge. You will now see the left-over letters displayed. With those letters you will be asked to answer the question, "How do you feel about computing?" You are now given a hint explaining that the answer is four words in length and the letters are as follows. The display will show the remaining letters set in the location of each word. The letters will of course still be scrambled. Now all you have to do is answer the question. You should remember that this answer will include spaces. If your answer is incorrect, then you will hear a buzzer and the wrong answer will be erased. If it is the correct answer, then you will hear several bell sounds and the game will end.

Before you type in this program there are several things you should know to make the game more fun. First, after you have answered a clue and before going on to a new clue, find your answer at the top of the screen and highlight it. As you continue to highlight more and more letters it will leave other answers more visible at the top. Secondly, if you switch to lower case letters it will be easier to see highlighted letters. To switch between upper and lower case letters press the SHIFT and COMMODORE keys simultaneously. Enjoy the game. I hope you have as much fun playing Cross-Search as I had making it.

Before typing this program, read "How to Enter Programs" and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30007, Shreveport, LA 71130-0007, 1-800-831-2694.

**Cross-Search**

```
5 POKE 53280,0:POKE 53281,0'CPLH
10 S=54272:FOR Q=0 TO 24:POKE S+Q,0
   :NEXT Q:POKE S+24,15'JADI
20 POKE S,225:POKE S+1,5
   :POKE S+6,240'FRME
30 POKE S+7,165:POKE S+8,117
   :POKE S+13,240'GVGH
45 PRINT"[CLEAR,RVS,RED,SPACE13,RVOFF,
   GREEN] CROSS-SEARCH [RED,RVS,
```

*Continued on pg. 102*



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Continued from pg. 100

```
    SPACE29]";'BBJQ
50 PRINT"[SPACE3]";'BBBC
51 PRINT"[SPACE22,RVOFF,GRAY3]
   BENITUORBUSCAELBAMMARGORPROLOCREDR
   OB[RED,RVS]";'BBKR
52 PRINT"[SPACE4,RVOFF,GRAY3]
   ALPAGSPERIPHERALTACROTARENEGEPOLEV
   NE[RED,RVS,SPACE4,RVOFF,GRAY3]
   CBIANTEAANDAR";'BBYV
53 PRINT"OSRUCSNOITAREPOFOREDROG[RED,
   RVS,SPACE4,RVOFF,GRAY3]
   KAXKOERDNCIREMUNAHPLAFFUNCTIONKE";
   'BBSX
54 PRINT"YSIO[RED,RVS,SPACE4,RVOFF,
   GRAY3]GNEILSAODYRACNOITIDNOCEENILM
   ARGORPST[RED,RVS,SPACE4,RVOFF,
   GRAY3]RELLORT";'BBNX
55 PRINT"NOCECAFRETNIOEDIVIYROMEMFOTU
   O[RED,RVS,SPACE4,RVOFF,GRAY3]
   OTBOOEILMNCTFYHOMERANDOMAC";'BBBA
56 PRINT"CESSMEMORY[RED,RVS,SPACE4,
   RVOFF,GRAY3]UAABTTNYNETERRNULLSTRI
   NGTWEDOCNEERCS[RED,RVS,SPACE4,
   RVOFF,GRAY3]N";'BBAA
57 PRINT"NSYGCGMUUMREAHSTANDARDCHARAC
   TERMODE[RED,RVS,SPACE4,RVOFF,GRAY3]
   DIITNASEMQOMTNPCVNOI";'BBWC
58 PRINT"TACOLYROMEMANCNX[RED,RVS,
   SPACE4,RVOFF,GRAY3]CDDEIRYMBEDENIO
   ENGTNESERPTONECIVEDAE[RED,RVS] ";
   'BBUC
59 PRINT"[SPACE3,RVOFF,GRAY3]
   ØRFMRASOEREMIBKGBUSOGTUOHTIWNRUTER
   MC[RED,RVS,SPACE4,RVOFF,GRAY3]
   LOIITHTRRFLOSR";'BBIE
60 PRINT"ETCARAHCCIHPARGMNORPMU[RED,
   RVS,SPACE4,RVOFF,GRAY3]
   OOSTSCEYDAERCISABGTCHCTAMSIMEPYTC";
   'BBEU
61 PRINT"UOT[RED,RVS,SPACE4,RVOFF,
   GRAY3]RCOLORMEMORYWECIVEDECAFRETNI
   DNUOSYCE[RED,RVS,SPACE14]";'BBFT
62 PRINT"[SPACE63]";'BBEM
63 PRINT"[SPACE6,GRAY3]";'BBWH
65 X$="[HOME,DOWN19]"'BCGJ
69 L$="[GREEN,RVS] LETTERS =[RVOFF,
   GRAY3]":W$="[GREEN,RVS] WORD (S) =
   [RVOFF,GRAY3]":CU$="[GREEN,RVS]
    CLUE =[RVOFF] [GRAY3]"'DJTB
70 WD$=X$+"[DOWN5]":WD$=WD$+"[GREEN,
   RVS] ANSWER =[RVOFF] [GRAY3]"
   :N$="[GREEN,RVS] NUMBER =[RVOFF,
   GRAY3]"'FPUR
80 AN$="[HOME,DOWN18,CYAN]ANSWER
   : [GREEN]"'BDCJ
100 DIM D(24),T(53),AA(26),BB(29)
    :D(Ø)=Ø:T(Ø)=Ø'DMTE
110 FOR Q=Ø TO 26:READ AA(Q)
    :NEXT Q'FMCB
120 FOR Q=Ø TO 29:READ BB(Q)
    :NEXT Q'FMHC
200 READ A,B,C$:Z=Z+1:IF A=Ø THEN Z=Ø
    :RESTORE:GOTO 110'JUQG
210 FOR Q=1 TO A:READ D(Q):NEXT Q'FKCC
220 GOSUB 10000:PRINT X$;L$;A;W$;B;N$;
    Z:PRINT CU$;C$:PRINT WD$;'EKCI
230 FOR Q=1994 TO 1993+A:POKE Q,160
    :NEXT Q'GSCG
240 IF T(Z)=Ø THEN 300'DIPD
250 FOR Q=1994 TO 1993+A
    :POKE Q,D(Q-1993):NEXT Q'HXEK
260 GET S$:IF S$=""THEN 260'EISG
265 IF S$="[F7]"THEN 400'DFTK
267 IF S$="[F1]"THEN 200'DFOM
270 GOTO 260'BDHE
300 FOR Q=1 TO A'DDDY
310 GET Y$:IF Y$=""THEN 310'EIBC
320 IF Y$="[F1]"THEN Q=A:NEXT Q:Y$=""
    :GOTO 200'HNUG
330 IF Y$="[F7]"THEN Q=A:NEXT Q:Y$=""
    :GOTO 400'HNAH
340 Y=ASC(Y$):IF Y<65 OR Y>90 THEN
    310'HPGJ
350 PRINT Y$;:NEXT Q:E=Ø'DIPF
360 FOR Q=1994 TO 1993+A:M=PEEK(Q)
    :IF M <>D(Q-1993)THEN E=1'MCJR
370 NEXT Q'BBKE
375 IF E=1 THEN GOTO 378'EFHM
378 FOR Q=1994 TO 1993+A:POKE Q,160
    :NEXT Q:PRINT WD$;:GOSUB 10050
    :GOTO 300:RETURN'KJOA
380 GOSUB 10060:T(Z)=1:GOTO 260'DPAJ
400 L=1106'BFWY
410 X=PEEK(L)'CEEB
415 I=PEEK(L)'CEOG
420 IF I>128 THEN POKE L,(I-128)
    :GOTO 440'GQRH
430 POKE L,(I+128)'CIMD
440 GET P$'BCVD
450 IF P$="[F1]"THEN:POKE L,X
    :GOTO 200'FKLI
460 IF P$="[F7]"THEN:POKE L,X
    :GOTO 600'FKSJ
470 IF P$="[UP]"THEN:IF
    PEEK(L-40)<>160 THEN:POKE L,X
    :L=L-40:GOTO 410'NYYT
480 IF P$="[DOWN]"THEN:IF
    PEEK(L+40)<>160 THEN:POKE L,X
    :L=L+40:GOTO 410'NYYT
490 IF P$="[LEFT]"THEN:IF
    PEEK(L-1)<>160 THEN:POKE L,X:L=L-1
    :GOTO 410'NWPU
500 IF P$="[RIGHT]"THEN
    :IF PEEK(L+1)<>160 THEN:POKE L,X
    :L=L+1:GOTO 410'NWJM
510 IF P$=" "THEN:GOSUB 530'EGOD
520 GOTO 415'BDJC
530 IF X>128 THEN:X=X-128:RETURN'GLCI
540 X=X+128:RETURN'DGKG
600 V=Ø:FOR Q=1106 TO 1702
    :IF PEEK(Q)<128 THEN V=V+1'KWFL
610 NEXT Q:IF V<>26 THEN 400'FITF
650 V=Ø:W=Ø'CFUH
660 FOR Q=1106 TO 1702:IF PEEK(Q)<128
    THEN V=V+1:IF PEEK(Q)<>AA(V)THEN
    W=1'PFRW
670 NEXT Q:IF W=1 THEN 400'EHNL
700 PRINT"[CYAN,CLEAR,DOWN,SPACE3]OK
```

Continued on pg. 104

Continued from pg. 102

```
      :[YELLOW,SPACE2]YOU HAVE MADE IT
      THIS FAR, BUT"'BAAM
710 PRINT"[SPACE8]THERE IS ONE MORE
      CHALLENGE.":'BBSL
720 PRINT"[WHITE,DOWN,SPACE3]
      THE LETTERS LEFT BY THE PUZZLE
      ARE!!![DOWN2]"'BAUN
730 FOR Q=55543 TO 55569:POKE Q,5
      :NEXT Q'FRDK
740 FOR Q=1 TO 26:POKE(1271+Q),AA(Q)
      :NEXT Q'GUGN
750 PRINT"[WHITE,SPACE4]
      USING THESE LETTERS,
       ANSWER THIS!!!"'BAOQ
760 PRINT"[DOWN,SPACE4]
      'HOW DO YOU FEEL ABOUT
      COMPUTING?'"'BAMR
770 PRINT"[DOWN,CYAN] HINT
      :[YELLOW,SPACE2]THE ANSWER IS
      FOUR WORDS IN"'BAGT
780 PRINT"[SPACE8]LENGTH AND THE
      LETTERS ARE AS"'BAKS
790 PRINT"[SPACE8]FOLLOWS."'BATN
800 PRINT"[DOWN,GREEN,SPACE8]
      PGUTICOMN SI WYAALS
      TNACATFIS"'BACM
801 PRINT"[DOWN2,WHITE,SPACE17,^,
      SPACE2,^,SPACE6,^]"'BACH
802 PRINT"[DOWN,SPACE12]
      INCLUDE THESE SPACES."'BAFL
805 AN$="[HOME,DOWN18,CYAN]ANSWER
      : [GREEN]"'BDCM
810 GOSUB 10010:PRINT AN$;'CKNG
815 FOR Q=1 TO 29:'DFDK
820 GET Y$:IF Y$=""THEN 820'EIHI
830 Y=ASC(Y$):IF (Y>90) OR (Y<65) AND
      (Y<>32) THEN 820'KYDR
840 PRINT Y$;:NEXT Q:W=0'DIIJ
850 FOR Q=1 TO 29:M=PEEK(1751+Q)
      :IF M<>BB(Q)THEN W=1'LWKT
860 NEXT Q:IF W=1 THEN:GOSUB 10050
      :GOTO 810'GOUO
865 FOR Q=0 TO 5:GOSUB 10060
      :NEXT Q'FLMS
899 END'BACU
900 DATA 0,1,1,19,20,3,1,14,9,19,9,20,
      1,3,6,7,9,12,13,14,15,16,19,20,21,
      23'BPCP
910 DATA 25,0,3,15,13,16,21,20,9,14,7,
      32,9,19,32,1,12,23,1,25,19'BFOO
920 DATA 32,6,1,14,20,1,19,20,9,3'BYLK
1000 DATA 24,3,"(VIC)",22,9,4,5,15,9,
       14,20,5,18,6,1,3,5,3,15,14,20,18,
       15'BFKF
1001 DATA 12,12,5,18'BKGV
1002 DATA 21,3,"ORIGINAL MODE ON
       POWER UP AND[SPACE3]PROGRAMMING",
       19,20,1,14,4'BSAK
1003 DATA 1,18,4,3,8,1,18,1,3,20,5,18,
       13,15,4,5'BMDD
1004 DATA 20,3,"(SID)",19,15,21,14,4,
       9,14,20,5,18,6,1,3,5,4,5,22,9,3,
       5'BDNI
1005 DATA 18,3,"(RAM)",18,1,14,4,15,
       13,1,3,3,5,19,19,13,5,13,15,18,
       25'BCXJ
1006 DATA 18,3,"(E.M.) RETURN BEFORE
       OR LACKING GOSUB",18,5,20,21,18,
       14,23'BALN
1007 DATA 9,20,8,15,21,20,7,15,19,21,
       2'BDMF
1008 DATA 17,3,"MATHEMATICAL
       SEQUENCE",15,18,4,5,18,15,6,15,
       16,5,18,1,20,9'BQWP
1009 DATA 15,14,19'BIQE
1010 DATA 17,2,"THEY'RE
       NON-ALPHANUMERIC",7,18,1,16,8,9,
       3,3,8,1,18,1,3,20'BMRI
1011 DATA 5,18,19'BHBV
1012 DATA 17,2,"PRODUCES WAVEFORMS",5,
       14,22,5,12,15,16,5,7,5,14,5,18,1,
       20'BSRJ
1013 DATA 15,18,16,3,"(E.M.) NO
       PERIPHERAL DEVICE",4,5,22,9,3,5,
       14,15,20'BIDK
1014 DATA 16,18,5,19,5,14,20'BSUB
1015 DATA 15,2,"POKE 53281,X",2,1,3,
       11,7,18,15,21,14,4,3,15,12,15,
       18'BTWK
1016 DATA 15,2,"LOCATION OF CHARACTER
       PATTERNS",3,8,1,18,1,3,20,5,18,
       13,5'BGQO
1017 DATA 13,15,18,25'BLKD
1018 DATA 15,2,"COMPUTER LANGUAGE",13,
       1,3,8,9,14,5,12,1,14,7,21,1,7,
       5'BPLO
1019 DATA 15,2,"THE BRAINS OF THE
       COMPUTER",15,16,5,18,1,20,9,14,7,
       19,25'BJWR
1020 DATA 19,20,5,13'BKHW
1021 DATA 14,3,"(ROM)",18,5,1,4,15,14,
       12,25,13,5,13,15,18,25'BSIF
1022 DATA 14,2,"STORAGE ADDRESS",13,5,
       13,15,18,25,12,15,3,1,20,9,15,
       14'BSHJ
1023 DATA 13,3,"(E.M.) 256
       CHARACTERS",19,20,18,9,14,7,20,
       15,15,12,15,14,7'BQOL
1024 DATA 12,2,"(E.M.)STRING INSTEAD
       OF A NUMBER",20,25,16,5,13,9,19,
       13,1'BEKN
1025 DATA 20,3,8'BGRB
1026 DATA 12,1,"NON-GRAPHIC
       CHARACTERS",1,12,16,8,1,14,21,13,
       5,18,9,3'BKRO
1027 DATA 12,1,"INSTRUCTIONS CAPABLE
       OF BEING[SPACE3]PROCESSED BY THE
       COMPUTER"'BFHS
1028 DATA 16,18,15,7,18,1,13,13,1,2,
       12,5'BFXJ
1029 DATA 12,2,"1024 TO 2023",19,3,18,
       5,5,14,13,5,13,15,18,25'BMDO
1030 DATA 12,2,"(RND) 0.000000001 TO
       0.999999999",18,1,14,4,15,13,14,
       21,13'BFGI
1031 DATA 2,5,18'BGUX
1032 DATA 12,2,"EIGHT TO THE RIGHT OF
       KEYBOARD",6,21,14,3,20,9,15,14,
```

Continued on pg. 106

*Continued from pg. 104*

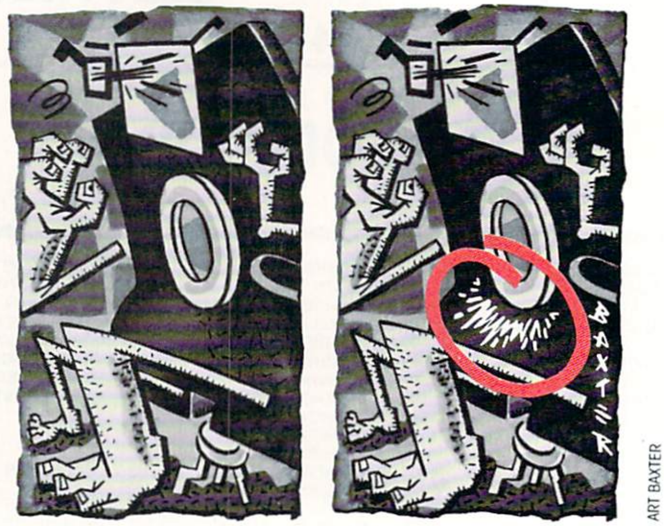
```
     11,5'BGDM
1033 DATA 25,19'BFCA
1034 DATA 12,2,"UPPER AND LOWER-CASE
     LETTERS AND GRAPHIC CHARACTERS",
     3,8,1'BLEQ
1035 DATA 18,1,3,20,5,18,19,5,20'BWBF
1036 DATA 11,2,"55296 TO 56295",3,15,
     12,15,18,13,5,13,15,18,25'BLKM
1037 DATA 11,2,"POKE 53280,X",2,15,18,
     4,5,18,3,15,12,15,18'BJIM
1038 DATA 11,2,"80 CONSECUTIVE
     CHARACTERS",16,18,15,7,18,1,13,
     12,9,14,5'BJSR
1039 DATA 11,3,"(E.M.) NO MORE (RAM)",
     15,21,20,15,6,13,5,13,15,18,
     25'BLEQ
1040 DATA 10,2,"NUMBERS REPRESENTING
     CHARACTERS",19,3,18,5,5,14,3,15,
     4,5'BEKL
1041 DATA 10,2,"COMMANDS EXECUTED
     IMMEDIATELY",4,9,18,5,3,20,13,15,
     4,5'BEXM
1042 DATA 10,1,"POINT FOUND BY ITS X
     AND Y VALUE",3,15,15,18,4,9,14,1,
     20,5'BFCN
1043 DATA 10,1,"PRINTER, DISK DRIVE,
      TAPE PLAYER, AND OTHER DEVICES",
     16,5'BKJQ
1044 DATA 18,9,16,8,5,18,1,12'BTQF
1045 DATA 10,2,"NOTHING BETWEEN TWO
     QUOTES",14,21,12,12,19,20,18,9,
     14,7'BIXQ
1046 DATA 10,1,"SMALL PROGRAM IN
     LARGER PROGRAM",19,21,2,18,15,21,
     20,9,14'BFSR
1047 DATA 5,9,1,"CONNECTION BETWEEN
     COMPUTER AND PERIPHERAL",9,14,20,
     5,18'BTMT
1048 DATA 6,1,3,5,9,1,"SOUND WAVES
     PER SECOND",6,18,5,17,21,5,14,3,
     25'BKVS
1049 DATA 9,1,"EITHER TRUE OR FALSE",
     3,15,14,4,9,20,9,15,14'BCGR
1050 DATA 8,1,"TRIANGLE, SAWTOOTH,
      PULSE, NOISE",23,1,22,5,6,15,18,
     13'BATM
1051 DATA 8,1,"(K) 1024",11,9,12,15,2,
     25,20,5'BASF
1052 DATA 7,1,"PERFORM A COMMAND",5,
     24,5,3,21,20,5'BVEJ
1053 DATA 7,1,"BASIC INSTRUCTION",3,
     15,13,13,1,14,4'BWYK
1054 DATA 7,1,"BIT=(0 OR OFF)",4,9,19,
     1,2,12,5'BUXJ
1055 DATA 6,1,"COMPRESS A PROGRAM",3,
     18,21,14,3,8'BTUM
1056 DATA 6,1,"FLASHES ON AND OFF",3,
     21,18,19,15,18'BVPN
1057 DATA 6,1,"BIT=(1 OR ON)",5,14,1,
     2,12,5'BSGM
1058 DATA 6,1,"BASE-2 SYSTEM",2,9,14,
     1,18,25'BTPN
1059 DATA 5,1,"BEGINNER'S ALL-PURPOSE
     SYMBOLIC INSTRUCTION CODE",2,1,
     19,9'BNVX
1060 DATA 3,5,1,"ONE DOT RESOLUTION",
     16,9,24,5,12'BTUI
1061 DATA 4,1,"(S SHIFT A) OR S
     [SHFT A]",19,1,22,5'BOAH
1062 DATA 4,1,"(TI)",20,9,13,5'BOWF
1063 DATA 4,1,"(G SHIFT O) OR G
     [SHFT O]",7,15,20,15'BPDJ
1064 DATA 4,1,"(R SHIFT E) OR R
     [SHFT E]",18,5,1,4'BNHK
1065 DATA 4,1,"UPPER RIGHT HAND
     CORNER",8,15,13,5'BOLN
1066 DATA 4,1,"(P SHIFT O) OR P
     [SHFT O]",16,15,11,5'BPPN
1067 DATA 0,0,"0",0'BGYH
10000 FOR Q=1784 TO 2023:POKE Q,32
      :NEXT Q:RETURN'GRYX
10010 FOR Q=1744 TO 1783:POKE Q,32
      :NEXT Q'FQNX
10020 FOR Q=1752 TO 1780:POKE Q,160
      :NEXT Q'FRJY
10030 POKE 1761,32:POKE 1764,32
      :POKE 1771,32'DXRA
10040 FOR Q=56024 TO 56052:POKE Q,5
      :NEXT Q:RETURN'GSFC
10050 POKE S+4,33:FOR Q=0 TO 500
      :NEXT Q:POKE S+4,32:RETURN'JUHF
10060 FOR C=0 TO 3:POKE S+11,17
      :FOR F=0 TO 150:NEXT F
      :POKE S+11,16:FOR F=0 TO 50
      :NEXT F'PHRH
10070 NEXT C:RETURN'CCPY
```

END

by Michael D. Leidel

# Compare-PGM

*For the 64, 128 and Plus/4*



ART BAXTER

## Easily compare any two program listings to find changes, insertions and deletions.

Programmers often save the same program on more than one disk or under different filenames on the same disk. There may be several reasons for making multiple copies of a program: backing up for security, program development, or distribution to users. Finally, a program might accidentally be saved on a different disk.

In any case, if one of the duplicated versions is altered then they are no longer the same program. If modifications are made to one of several copies we need a way to know which one has been altered. Even if we know which one was changed, how will we remember exactly what changes were made?

### The VERIFY Command

The VERIFY command will tell us that two programs are different. If there are more than two programs to be checked, VERIFY can quickly find the altered version. However, VERIFY will never tell us *where* the programs differ.

### Documentation

Documenting program changes in REM statements could be the best solution. Changes could be noted in REM statements near the beginning of the program. The date, line number and comment for each change would suffice. For example:

110 REM 7/20/87:801:inserted line

112 REM 8/5/87:810-855:new merge logic

Even a single date of the last update as a comment would help. However, because we are human no matter how dedicated we become at documenting programs, errors will be made.

### Compare-PGM provides an answer

Compare-PGM is a programmer's tool to help find programmatic differences between two PGM disk files. It can be run without modification on the 64, 128 and Plus/4 computers. It reads each program at the same time comparing them — line by line. It takes several short-cuts by passing over spaces, colons and REM statements since logically they don't make a difference. Compare-PGM compares one program file against a second, listing by line number all CHANGES, INSERTS and DELETES occurring in the second program.

### USING Compare-PGM

Compare-PGM is small and easy to use. First, the programs to be compared must be saved on the same diskette. Then LOAD Compare-PGM and RUN. When you enter the filenames of the programs, remember that the Compare-PGM will list the line numbers from the *second* program that are found to be *different*. After entering the filenames, you may select whether to print the output on the (S)creen or (P)rinter. While the program is running, press "Q" to end the program and press any other key to pause and resume. ■

Before typing this program, read "How to Enter Programs" and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30007, Shreveport, LA 71130-0007, 1-800-831-2694.

**Compare-PGM**

```
110 PRINT"[CLEAR,RVS,SPACE8,SHFT C]
    [SHFT O] [SHFT M] [SHFT P]
    [SHFT A] [SHFT R] [SHFT E,SPACE2,
    SHFT P] [SHFT G] [SHFT M,SPACE12,
    RVOFF]"'BAJJ
120 PRINT"[DOWN,SHFT E]NTER[SPACE2]
    FIRST [SHFT P,SHFT G,SHFT M]
     FILE NAME":INPUT F1$'CECH
130 PRINT"[SHFT E]NTER SECOND [SHFT P,
    SHFT G,SHFT M] FILE NAME"
    :INPUT F2$'CEHI
140 PRINT:PRINT"[SHFT P]
    RESS 'Q' TO QUIT, [SHFT P]
    RESS ANY OTHER KEY"'CBLL
150 PRINT"[SPACE7]TO HALT AND RESART."
    :PRINT'CBOH
160 R$=CHR$(143):INPUT"([SHFT S]
    )CREEN OR ([SHFT P])RINTER";
    V$'DLWL
165 OPEN 2,8,2,F1$+",P,R"
    :OPEN 1,8,15'DQCM
170 INPUT#1,E,E$:PRINT E,E$,F1$
    :IF E>0 THEN 700'FVMJ
180 OPEN 5,8,5,F2$+",P,R":INPUT#1,E,E$
    :PRINT E,E$,F2$:IF E>0 THEN
    700'HGFO
190 GOSUB 660:PRINT:PRINT"[SHFT M]
    ODIFICATIONS TO ";F2$;":":PRINT
    :GOSUB 680'FPRP
200 GET#2,A$,A$:GET#5,A$,A$
    :GOSUB 420'DVBB
210 L1$=""'BDHX
220 GET#2,A$:IF ST>0 THEN E2=1
    :GOSUB 430:GOTO 280'HUSG
230 IF A$=""THEN RF=0:GOTO 280'FJGE
240 IF A$=" "OR A$=":"THEN 220'FHEE
250 IF RF THEN 220'CFSD
```

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Then you can move the light about to spotlight other areas in the square. Without a light, you can "feel" your way around in the dark by choosing "what is" and scanning the room with the cursor. That enables you to find light switches. The game has five alternative endings, so you can play it more than once. (A separate disk is required for each saved game position.)

### To Outer Space and Spanish Main

Even more action awaits those who enter the world of *Dan Dare, Pilot of the Future.* Based on a British comic strip character, Dan Dare is an action-style adventure that combines arcade thrills with object-oriented puzzles as you try to prevent an asteroid from crashing into earth.

Mekon, an evil alien, has programmed the asteroid on the collision course as a way of forcing earth to surrender to him. His main base is on the asteroid, depicted with TV-style cartoons and exceptional animation, where you must also rescue some of your friends from the alien Treens. A joystick interface lets you move Dan around and make decisions involving objects that may be manipulated. Look for another Electronic Arts import soon — *Dragon's Lair.* This one combines all the sequences from the arcade games (Both *Lair I* and *Lair II*, all on the same disk) into a fast-moving action adventure.

Yet another action-packed adventure, *Pirates!* is the first role-playing game from MicroProse (best known for their aerial simulators). This one plays a lot like *Seven Cities of Gold.* You assume the role of a pirate whose goal is to acquire a fortune in booty. This means tracking down clues to the location of a pair of treasure ships. Characters you meet along the way will offer tips and hints.

There's plenty of combat in store. You can fight ship-to-ship and ship-to-shore, and when attacked by an enemy captain you may choose from three kinds of swords for man-to-man battle. Sometimes victory in a sword fight nets you a new ship or maybe a new piece of a treasure map. Besides seeking treasure and fighting the enemy, you'll have a number of other quests to fulfill. These are usually interlocked: find enough pieces of the map showing the location of a lost relative, and you'll get part of a map showing the hiding place of a vast Inca treasure. You've also got to keep your crew satiated with plunder, loot and food, or they'll grow restless and desert, taking your gold with them.

The interface relies solely on the joystick. You get a bird's-eye view of the ocean and your ship, and see a menu of actions and an illustration when you enter a town. Sound effects are varied and well-done. It's not too demanding a quest, but the engaging activities and pleasant interface make this worth your while if you like games focusing on exploration and acquisition — or if you just happen to like *Pirates!*

### Last Minute News

*Bard's Tale III* will be released on the Apple first, though the first two were initially done on the 64. Seems to be related to the fact that author Michael Cranford has left Interplay to launch his own company. (Interplay is doing the sequel.) *Beyond Zork*, which will require a 128 or an Amiga, will be the first Infocom game that lets you actually fight grues! Not only that, but you'll also have role-playing attributes like armor class and dexterity instead of just a score, there'll be countless monsters to fight, spells to cast, stores to shop in — plus color, auto-mapping and an Undo feature!

### Clues of the Month Club

Ken St. Andre, who runs the Adventure Construction Set Fan Club, recently sent me a stack of tips for *Legacy of the Ancients.* Some of the most useful: Deadlier than monsters are the traps in the dungeons. To avoid them keep your command set on Xamine and hit the fire button every four steps or when you turn a corner. This will save hundreds of hit points. To get more than one sapphire on the same trip: save your character at the bottom of the dungeon in the Pirate's Cave, then shut down and reboot. The treasure chests will be restored. You can't get another Crown, but there will be another sapphire. Take it and repeat. This also works with boxes that restore hit points. In combat, especially deeper dungeon levels, spells are more powerful than weapons. Weaken a foe with flame or firebolt, then finish him off with your psycho-strength enhanced fighting ability. Save Kill Flash and Befuddles for real trouble.

Randy Sluganski offered this tip for *Phantasie III*: Visit straw hut east of Flagler early in the game and Nikademus will raise two of your party's attributes. To avoid getting burned in his Corridor of Fire, step on dots in this order: east, south, north, south, east, south, east, east, east. In Nik's room, break his wand. ■


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> *PTE* features an Undo command and also has the ability to recall all of your previously typed commands so you never have to worry about retyping a long command line if you make a mistake.

The state file for a given text file contains information like cursor position, insertion mode, currently marked text areas and tab settings. When a file is loaded for editing, if a state file exists for it, it will be executed, putting you in exactly the same position, with the same editing environment as when you last saved the file. No more typing a whole line of tab stops every time you start up the editor.

### Almost Perfect

Lest you think me on the author's payroll, I should also note some of *PTE's* limitations. One is certainly its orientation toward pure text; there is a distinct lack of any page formatting or text style functions. You can't display anything but "plain" text on the screen (no underlining or boldface).

Even with its commendable manual, *PTE* is complicated enough to require ten to twenty hours to become really familiar with it. Programmers will have no difficulty learning it, and it's a lot of fun to fiddle around with and see what you can make it do. Beginners, on the other hand, would be better off with an editor whose keys cannot be accidentally redefined.

One of *PTE's* drawbacks is its sheer size. It takes over 100K of RAM, and on a 512K Amiga with *PTE* running and a couple of windows open, there isn't room for a whole lot else.

### Summary

What *Professional Text Engine* does, it does brilliantly, which is complex, multi-file "power" text editing and manipulation. I cannot recommend *PTE* for word processing, for novices, or as a general purpose "quick fix-up" editor. On an Amiga with more than 512K of RAM, it functions splendidly as a resident program development editor, and its ability to fine-tune every keystroke to your individual taste makes it a joy to use. ■

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you make corrections, or use short cuts like moving down a line and then back a few characters, to highlight exactly the text to be deleted.

Once the desired text is properly highlighted, press the F7 key again. This time a new menu is displayed with options to Exit the Mark Mode, Delete the Marked Text, or Save the Marked Text. The Exit option lets you abort marking text without affecting the original message. If your original intention was to delete the block of marked text, then move the cursor to the Delete command and press F1. The marked text will be deleted and you'll return to the insert mode again, at the point immediately following the deleted text.

Deleting a block of text with this method has other advantages. The deleted text is actually saved in an internal buffer by the editor, even though it has been deleted from the main body of the message. The original, deleted text is still available from the internal save buffer until another block of text is marked. Thus, if you made a mistake, the deleted text can be restored if necessary.

The Append Text function in the edit menu is what recalls any saved text from the internal buffer and inserts it at the current cursor position. Thus, the combination of marking text, deleting the marked text, and then appending the text saved by the deletion actually can be used to perform a block move of text. The only restriction is that you cannot move more than nine lines of text at a time, since that's the maximum number of lines that can be marked.

One important thing to remember is that any saved text is not lost when it's appended, so multiple copies can be inserted if desired. But if you want to simply duplicate lines or blocks of text, there's no need to delete the lines first. After marking the desired block of text and pressing F7, the menu allows Saving the Marked Text without deleting the original characters. The original message is untouched, but the marked text is available in the internal save buffer.

As I mentioned above, any saved text in the internal buffer is not lost when you append it into the original message. Actually, the saved text is never lost until you mark a new block of text or you log off the system. I found this extremely handy for handling very long text entries, where I came to the 80-line limit of a message in the middle of a paragraph. Ideally I'd like to move that entire paragraph to the next message and start over from there, but I wouldn't want to retype what I just entered.

> Since almost everywhere you go on Q-Link involves reading or posting messages, I thought I would go over the various features of the message editor

Well, it's really pretty simple. When you hit the 80-line limit, activate the editor menu by pressing F7 and choose Put Mark. Now use the cursor up keys to mark the text backwards to the beginning of the paragraph. Press F7 again to get the next menu and select Delete Marked Text. The paragraph is deleted from the current message and you're returned to insert mode at the end of the message text. If desired, you can add some sort of continuation warning. Press F7 and select Send Message to post the current text.

Now to post the continuation, you first have to re-display the message you just entered. You don't have to display the entire message, so you can press F5 to terminate the display as soon as the heading appears. Pressing F7 brings up a menu that allows posting a response to the original message. Selecting that option starts up a new message that will be posted as a response to the message just displayed, but you have to enter another heading line for the new message.

Once the new message is started and you're into the insert mode, ready to start typing text, press F7 before doing anything else. Now use the Append Text function to insert the text that was previously deleted from the original message. The text is still available in the internal save buffer, even though you're now working on another message. After the text is inserted you can continue typing as usual and complete the information. Easy, huh?

If your information is extremely long, and you need to enter additional responses, you only need to display the original message the first time. After a message has been displayed in any message board, posting a response to that message automatically adds your response to the end of the current responses. Thus, you can simply add one response message after another or add your response to an existing string of response messages, after the original message has been displayed only once.

Well, that covers most of the message editor functions with the exception of the Overwrite Mode. I haven't found much use for this mode yet, but it is there if you want to experiment with it. When you activate this mode, existing text will be overwritten with new text as you type, instead of pushing the old text down the screen. This can get a little confusing, since RETURN characters are counted just like any other character when overwriting text, and strange things can happen.

Whenever Overwrite Mode is selected, you'll always return to that mode until you finish the message or select the Insert Mode. This may have some strange effects on appending text as well. To avoid trouble, I recommend staying away from the Overwrite mode for now.

All of this is great in theory, but it takes a little practice and experimentation to really see how things work. So why not try it out and play around with the message editor a little. All you have to do is go to any message board on the system and select the option to create a new message. Enter any heading of your choice and then play around with the editor. Just be sure not to send the message to the system if you're just playing around! You'll just create a lot of work and waste Q-Link disk space if you post a meaningless message.

If you ever want to abort a message once you've started one, simply press the F5 key whenever you're in the insert mode. The system will ask for confirmation and all you have to do is press RETURN to terminate the editing session and discard any text entered. In case you haven't noticed, the system doesn't assign a serial number to a message until it's actually completed and sent to the system. The heading displayed while editing your message doesn't have a serial number displayed.

One other parting comment on messages: there are a few graphics keys available if needed. You might want to try using the shifted asterisk, plus, minus and up-arrow keys to see what they produce. All other graphics are disabled along with all other controls and special characters when using the message editor.

That should be enough to get newcomers started and teach a few old timers some new tricks with the message editor as well. As always, if you have any comments, questions or ideas for future columns, please let me know. I can be reached by E-Mail to RBAKER almost daily.

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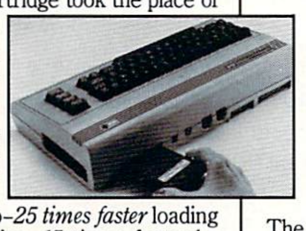
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*Continued from pg. 16*

as possible. If the interference persists, try reversing your power plug in its socket. This is impossible with three-prong plugs or polarized two-prongers, but on the others it sometimes gives impressive results.

• With TV sets, the antenna cable is the most likely entrance point for interference. Use a single piece of shielded coaxial cable between the compter and the TV's antenna terminals. (Your local electronics store should be willing to make one up for you.) If your set has a shielded antenna connector, use it. If it has only screw terminals, install a coax matching transformer. Eliminate all unshielded wiring in the antenna circuit, and eliminate the TV/computer switch box. Then you'll have to switch from TV to computer by physically switching the cables, but if you have the right cable connectors, that's not so hard to do.

• If you MUST retain the TV/computer switchbox, run a wire from the case of the switchbox to a good ground. In houses with three-prong electrical sockets, the screws on the outlet covers are usually very well grounded.

• If you like unusual interference fixes, try putting aluminum foil or a flat aluminum object under your computer. Fantastic results have sometimes been reported.

• You can use antenna filters to reduce screen interference on TV sets. Radio Shack's 15-581 and 15-582 have been known to give good results. Since you want to remove any interference being sent into your set, connect one end of the filter as close to the TV's antenna terminals as possible. Connect your switchbox and/or computer to the other end of the filter.

• If your computer interferes with other TV sets connected to the same antenna, one of the above filters can also be helpful. In this case, connect it between the common antenna line and your TV/computer switch box. Unlike in the tip just above, the idea here is to filter out whatever your computer may be feeding back into the antenna.

• Finally, if you have interference that you suspect is coming in over the power lines, try a line filter such as Radio Shack's 15-1111.

*Lucy S. Turrier*
*Alton, Illinois*

**Video test pattern generator**: The accompanying program is very useful in setting the controls on the video monitor or television display that you use with your computer. Be especially careful in typing line 180, and don't forget the semicolon at its end.

To use the program:

• Run it and press a key as instructed. You should see a pattern of eight vertical bars in different colors, with labels at the top of the screen and an instruction line at the bottom. If you get something else, check your typing.

• If your monitor or TV has an automatic brightness or color control, turn it off at this point. (From now on, we'll call this box a "monitor," even if it's usually used for watching football.)

• Turn the monitor's Brightness control all the way up, then turn it back down slowly, stopping as soon as the border appears deep black.

• Adjust your monitor's Color control until the colored bars have a pleasing intensity. Don't worry whether they are exactly the right color — just make them colorful enough to please the eye.

• Use the Tint control to give the bars the proper colors.

• Press any key. If you've typed the program correctly, your screen will be covered with a crosshatch pattern of black squares outlined in white. Set the monitor's Contrast control to give a pleasing overall appearance.

• Go through all these steps again and touch up the settings of your controls. That ends the use of this program for setting up your monitor.

You can use the crosshatch pattern to make more sophisticated adjustments on the monitor. If the squares aren't the same size in all areas of the screen, they can probably be made so by touching up the vertical height and linearity controls on your monitor. These are often found on the back of the housing or under a flip-up panel on the front.

If the crosshatch isn't uniformly white in all areas of the screen, your monitor's convergence may be out of adjustment. If it's bad enough to be distracting, see a qualified technician to have the adjustment made.

*Louis F. Sander*
*Pittsburgh, Pennsylvania*

```
100 PRINT"[CLEAR,RVS,SPACE2]
    VIDEO TEST PATTERN - LOUIS F.
    SANDER[SPACE2]"
110 PRINT:PRINT" THIS HELPS YOU
    OPTIMIZE THE SETTINGS"
120 PRINT" ON YOUR MONITOR OR
    TELEVISION SET.
130 PRINT"[DOWN] PRESS STOP TO QUIT
    NOW, OR PRESS ANY
140 PRINT" OTHER KEY TO SEE THE TEST
    PATTERNS...":GOSUB 270
    :REM WAIT FOR KEY
150 POKE 53280,0:POKE 53281,0
    : S$="[SPACE5]":REM SCREEN &
    BORDER TO BLACK, SETUP S$
160 PRINT"[WHITE]PURP WHT[SPACE2]BRN
    [SPACE2]ORNG LRED CYAN RED[SPACE2]
    YEL
170 FOR J=1 TO 23
180 PRINT"[RVS,PURPLE]";S$;"[WHITE]";
    S$;"[BROWN]";S$;"[ORANGE]";S$;"
    [L. RED]";S$;"[CYAN]";S$;"[RED]";
    S$;"[YELLOW]";S$;
190 NEXT
200 PRINT"[RVOFF,WHITE]SET BRIGHT,
     COLOR, TINT; THEN PRESS KEY";
    :GOSUB 270:REM WAIT FOR KEY
210 FOR J=1 TO 960:PRINT"[SHFT +]";
    :NEXT
220 PRINT"SET CONT, HOR & VERT,
     THEN PRESS A KEY.";:GOSUB 270
    :REM WAIT FOR KEY
230 GOTO 100
240 END
250 :
260 REM WAIT FOR KEYPRESS,
     CLEAR SCREEN
270 GET A$:IF A$=""THEN 270
280 PRINT"[CLEAR]";
290 RETURN
```

**SEQ file reader**: Here's an amazing one-liner that will read any sequential file and print its contents to the screen. Just replace

*Continued on pg. 116*

*Continued from pg. 114*

the word "filename" with the actual name of the file, then execute the program. Did you ever do so much with so little?

*John Matosky*
*Chicopee, Massachusetts*

```
10 REM ** SEQ READER - JOHN MATOSKY **
20 OPEN 8,8,8,"FILENAME":FOR J=0 TO 1
   :GET#8,A$:J=ST:PRINT A$;:NEXT
   :CLOSE 8
```

**PRINT @ on the 64:** This little program makes it easy to place the cursor at any position on the 64's screen. Once you have executed lines 20 and 30, you can place the cursor by executing

SYS 850,row,column

where "row" and "column" are the numbers of the appropriate screen location (the top row is numbered zero, as is the leftmost column). Row and column can appear in the program as numbers, variables or expressions.

*Sumit Aggarwal*
*New Delhi, India*

```
10 REM C-64 PRINT@  -  SUMIT AGGARWAL
20 REM TO USE: SYS850,ROW,COLUMN
30 FOR J=850 TO 865:READ K:POKE J,K
   :NEXT
40 DATA 032,155,183,138,072,032,155,
   183
50 DATA 104,170,164,101,024,076,240,
   255
```

**Beating the serial bus blues:** My Q-Link software, like many commercial programs, won't work if a printer or other peripherals are connected to the serial bus. Just turning them off isn't enough—they have to be physically unplugged from the bus. *[Editor's note: Only certain combinations of computers and peripherals cause this problem.]*

After months of moving my drive to get to the back panel, and months of wear and tear on my fragile connectors, I decided to do something better. A little experimentation showed that the connection causing the problem was the ATN line at pin 3 of the serial bus plug. This is the pin directly opposite the guide notch.

I made up a short connector cable with a miniature SPST toggle switch in this line, and now I can use my software without unplugging everything. My local Radio Shack carried all the parts, and I built the cable in a few hours for just a few dollars.

*Bruce H. McMillan*
*East Brookfield, Massachusetts*

**GEOS preference trick:** GEOS allows customized preferences to be put onto each disk, but it's normally fairly clumsy to do so. You either have to create one from scratch for each disk, or use the icons to copy one. An easier and faster way is to load up the Preference Manager and load the preference you want to copy. Remove the original disk and insert the disk that is to receive the preference, then save the preference onto that disk. Now remove the disk and replace it with another one to receive the same preference. Repeat this until your preference is on every disk that is to receive it. Finally, place the original disk back into the drive and exit the program.

*Leon S. Brandy*
*Christiansted, U.S. Virgin Islands*

**1670 silencer:** As most owners of Commodore's 1670 modem know, the 1670 is an auto-answer modem. That means that when the computer is on and the modem is connected, even if no modem program is running, the 1670 will pick up the line and start to send a carrier. That can be most disconcerting to callers who aren't expecting a computer to answer.

When this particular nuisance strikes, you don't need to turn off the computer or disconnect the modem. Just pick up the telephone and whistle into the mike. If you vary your pitch as if you're calling your dog, the modem will quickly shut up.

*Jason King*
*West Palm Beach, Florida*

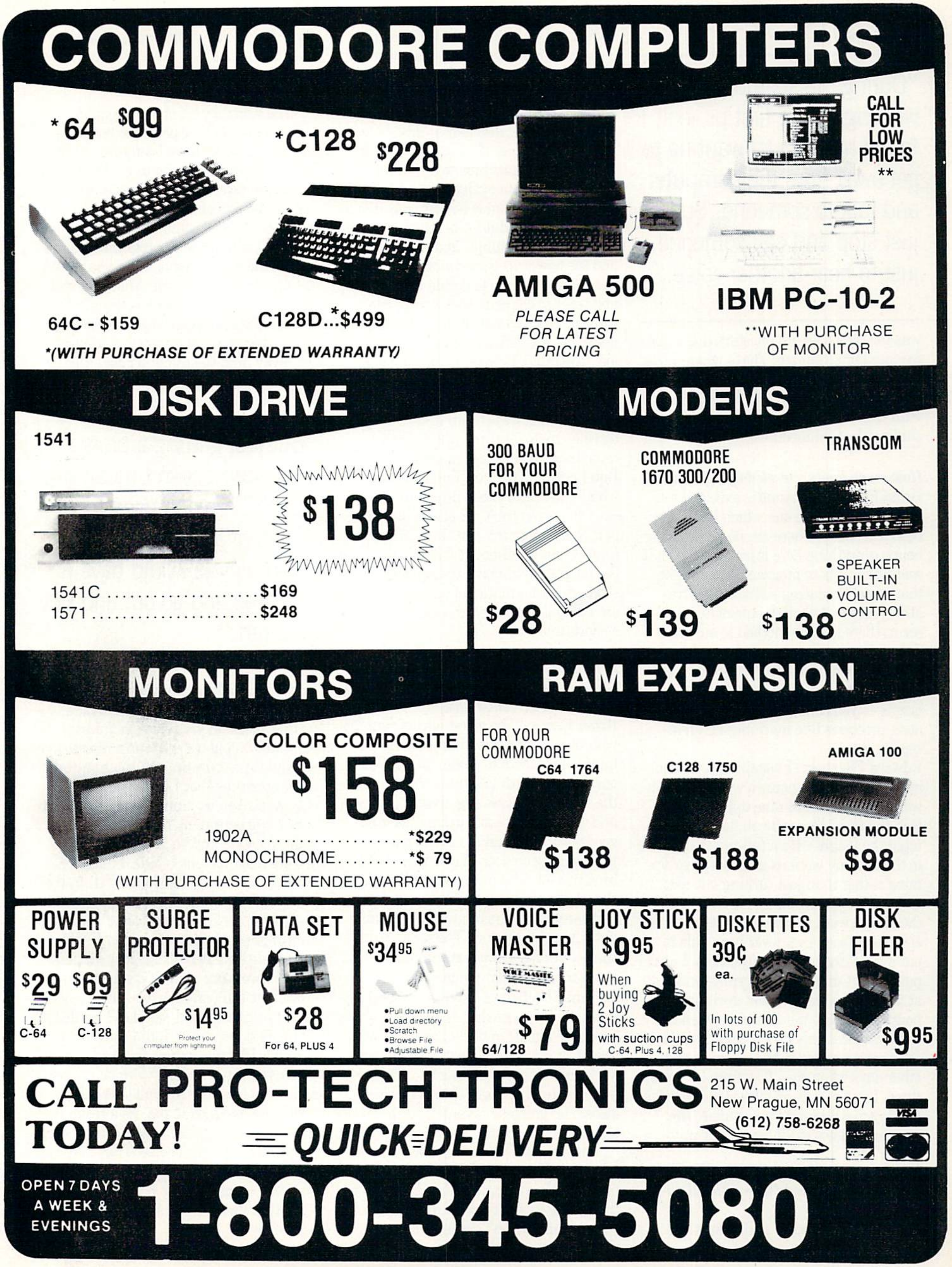
**Ribbon interchange:** The Commodore MPS-801 and the Comrex Model 220 printers use identical ribbons. If you own one of these and can't find ribbons, look for a ribbon for the other.

*Vinicio Perez Coto*
*San Jose, Costa Rica*

**Two printers with one computer.** It's well known that you can attach two printers to your serial bus as long as they have different device numbers. But even if they have identical device numbers, you can still do it, as long as only one of them has power applied at a time.

On Commodore printers, this means just flipping the main power switch off. But on printers that use an interface, it's the interface's power that makes the difference, since it is the interface that the computer sees as the printer. You can control the interface's power either by installing a switch or unplugging its power connection.

*Al Morrison*
*Baltimore, Maryland*


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"During the six months working on the first project, I found myself just wanting to get away from the computer and talk to someone. So I'd just stop and call someone, just to hear another voice."

was the 64 which got me started as a professional programmer. That's where I first began making money programming.

"I spend my days in a room surrounded with nine different computer systems including the Commodores."

***How many hours a week do you program?***
**Brian Fargo:** "Everyone is expected to put in at least 40 hours which has never been a problem. There are no set working hours, everything here is pretty relaxed. If someone wants to program at midnight, that's fine. Producing software is a creative process. Although outsiders may not see it, there is some method to our madness, but perhaps more madness than method. We are working with very creative people turning out creative programs — you can't just turn on the creative processes like machines on an assembly line."
**Edward Fletcher:** "I usually program an average of 45 to 55 hours a week. I usually work the traditional nine to five hours."
**Bob Lentini:** "Basically all day and all night (he laughs). It's a full-time job. I like to think of my work as creative programming rather than just turning out code. I feel that I an creating an environment for the user to work under. I see that as a very creative project. I've never been able to put a time clock on true creativity. I can't punch in at nine in the morning and quit at five and be creative just during those hours. There are many nights when the creative juices only flow from midnight until eight or nine in the morning and other days when they flow from seven to three. I just go with the flow. It's a wonderful way to work and I'm fortunate the company allows me to work that way."

***Do you get mental writing blocks similar to those experienced by traditional authors?***
**Brian Fargo:** "No, we really don't. We have so many people here with so many ideas we don't have to rely upon just one person."
**Edward Fletcher:** "Definitely. I think game programmers are really prone to this problem because games involve so many intangibles. They are not simply working out algorithms to do such-and-such. You have to evaluate what you are doing as to how fun it is, how easy it is to use and how good it looks. There is no set way to do these things. You just play it and see how it feels, and if it doesn't play just right you have to decide what to keep and what to change. After you've tried three or four approaches to a problem and it still doesn't feel just right, it's easy to feel frustrated. I remember sitting and staring at the screen asking myself 'what in the world am I going to do?' I finally just had to get away from it for a couple, three hours to clear my mind. Then I came back with a fresh approach."
**Bob Lentini:** "Yes I do. I reach points when I just can't create anymore. I just start short and can't get past a particular part of the program. But there are other times when the thought will just flow and the program will make tremendous strides in just a matter of days and friends are amazed at how much I can do in such a short time."

***Is there an advantage to programming alone, rather than working for one of the large software companies?***
**Brian Fargo:** "The worst part of running your own business is taking care of the mundane tasks like paying taxes. Before our contract with Electronic Arts, one of the worst parts was negotiating contracts and convincing people to trust us to do good work. That takes time and a lot of just banging on doors. Hopefully, that's behind us now. The most enjoyable aspect of the job is being able to work with a group of creative, intelligent guys and turning out a creative product. The tough part in the beginning was not getting paid — that's a real disadvantage."
**Edward Fletcher:** "I like having total say about the way a product is created. I wrote *Gridiron!* almost entirely alone so I was free to let my creative instincts go. I can work flexible hours if I want to. There is no pressure to conform to anyone else's ideas. The greatest advantage of working alone is being able to use my creativity to its fullest extent. I've always felt a little stifled working according to other's specifications. So writing *Gridiron!* allowed me the chance to work the entire project from start to finish. Don't get me wrong, I had input from other people as to what they did and did not like. But the concept was mine. I really enjoyed seeing my ideas become a reality.

"The worst aspect of working alone is the absence of other people to bounce an idea off. It would have been nice to have had more people around to get their input on how to tackle a problem or fine tune critical aspects of the game. I involved as many people as I could in those decisions but none of them were programmers so it wasn't the same kind of input you would get from a fellow worker. Another disadvantage of working alone is loneliness. During the six months working on the first project, I found myself just wanting to get away from the computer and talk to someone. So I'd just stop and call someone, just to hear another voice."

"But just getting a program published doesn't mean the wealth everyone used to dream of in the old days when people would have a hit game and go out and buy a Ferrari."

**Bob Lentini:** "The greatest advantage is working on your own schedule. There is no time clock on your creative juices. I personally could not work on a nine to five schedule and come up with the same quality of programs that I have done. I can only work well on a project which means something personally to me. I can't be told what to create and be given a deadline and turn out top notch code. I did *BobsTerm Pro* because I needed it first. In the process of creating it I realized that the rest of the world needed it also. That's the kind of project I like working on. The word processing and secretarial work station that I'm working on now is such a program. The company I'm working for needed the program, but I did also. I needed it for me first, but we're finding out that other people like the concept the way I like it. That's the way I work. I work on projects which are interesting to me, not things which are assigned to me. As a result, I think my products are better. It may work differently for other people. They may be able to take assignments and deadlines and turn out good code. It just doesn't work that way for me. My projects are labors of love."

***Is programming profitable and would you advise young computer enthusiasts to follow in your footsteps?***

**Brian Fargo:** "I think so. You can't deny the fact that computers are going to be everywhere in the next 10-20 years. They are going to be in every walk of life and anyone who doesn't have a computer and doesn't know how to use it is going to be at a real disadvantage. I know some of the colleges actually demand that you have a computer with you. Programming is a great profession, there are going to be plenty of opportunities for those who know how. I also recommend that you do a lot of hands-on work and don't rely entirely upon school because a lot of what is done in this industry requires skills that are not taught in the school system. It's important that you learn the machine itself and not just how programming works in general.

"Yes, programming can be profitable, but it is tough to survive. Trends are constantly changing. If you are good at hitting a moving target, this is the industry."

**Edward Fletcher:** "I wouldn't hesitate to recommend this profession to others. There's no question in my mind that programming is one of the best ways for a person to express his creativity. There still seems to be a strong demand for good programmers, so the money is good. At the same time this isn't a job of drudgery. Each day offers new challenges to face. There's a lot of satisfaction derived from getting a computer to perform the task you want it to."

> If you have any ambitions to program professionally, heed well their words, and perhaps you can avoid some of the pitfalls they had to endure.

**Bob Lentini:** "It can be, but it hasn't been as good for me as you might think. The two versions of *BobsTerm Pro* have been very successful. It has become quite a standard in the Commodore industry, but because of my deal with the distributor, it didn't change my life financially. It gave me some 'play' money in a sense. But I couldn't go out and buy an expensive car and sit back and invest my wealth. If I had to rely on my income from those programs to survive, I would be a bum in the street. Programming for me now has become profitable due to the company I am now working with. But just getting a program published doesn't mean the wealth everyone used to dream of in the old days when people would have a hit game and go out and buy a Ferrari. Times and market have changed. If you can get that deal, good for you. I didn't get it."

***Could you describe the steps required to start, finish and market a program?***

**Brian Fargo:** "You'll need to come up with a good idea and a very strong prototype before showing it to the publisher. If the product shows some promise you may be able to get the publisher to front you some money to finish it. Or you may need to finish it completely before you show it. We've done all that ourselves, but now that we've proven ourselves with some of our better selling products like *The Bard's Tale II*, *Mindshadow*, *Borrowed Time* and *Championship Golf* plus about 50 others, we sell the products differently. Now we'll sit down, spec the product out, do a story board, bring up some screen shots, really try to think the product through. Then we'll talk to our publisher and tell him what we want to build, how long we think it's going to take, and we'll get an ad-

vancement which is treated as advanced royalties. There'll be some milestone checks with the publisher along the way to satisfy him that what we are creating is what we agreed upon."

**Edward Fletcher:** "First you must have a good solid concept for your program. Think about it a long time before you begin writing. Then build the shell, the outline of the program and then begin filling in the detail. Get everything you want in the code and then begin letting people see it and give you their opinion — their feedback. The last thing and most time consuming chore is getting rid of all the bugs and making the software elegant. Most people fall short on this last phase. The program must be easy to use. That's why I like a mouse interface; it's so easy for the user to handle. I can't over-emphasize how important it is to make the program look and feel slick."

**Bob Lentini:** "The time required is long. the final version of *BobsTerm Pro 128* which you see on the shelf is two and a half years of struggle. I'm getting faster and better now. My newest project, a word processor, has taken only a year. But it just takes time to develop a serious piece of code. To design, beta test and get feedback from people just takes time. Then you have to find out what's wrong with the initial concept and modify it. I write entirely in machine language which makes for much faster, tighter code but it also makes it harder to convert between machines.

***You put a lot of time in every product, how can you be sure it will be marketable?***

**Brian Fargo:** "No one is ever sure a product is marketable, but you learn to depend upon your instincts. Hopefully, everything works out great. It usually takes somewhere from eight to 15 months to bring a product from conception to market."

**Edward Fletcher:** "I've always depended upon what I thought a program should be. I just go by a gut reaction as to whether a program will be marketable or not. I've been a computer fanatic for a while now and I've been buying computer games from the beginning, so I have a feel for what I expect and want in a game. The hard thing is trying to design a game that most people will want. If you can create a program no one has ever done, your chances of marketing it increase dramatically."

**Bob Lentini:** "I create programs that I need. If there is something I need my computer to do which I can't go to the store and buy, that is usually the birth of an idea. If I buy a few programs which are supposed to do a task and they don't perform well or the user interface is ugly or they are just impossible to learn that usually gets my dander up. That starts me thinking too. Whether I follow through and write the thing depends upon if I think it is worth a year or two out of my life to create. That's a tough decision, and it comes slowly for me. I can't be sure the stuff I write will be marketable other than I want it. I always talk to people in the industry and get their feedback about what I am thinking of programming. But I won't rush a product to market. I'm very proud of my work and won't put my name on just anything. I like to see a project through from beginning to end and that means a good year of my life. That's a full year of 16-hour days just eating, breathing, living and sleeping that project."

***How do you go about selling a product to a large distributor like Activision or Electronic Arts?***

**Brian Fargo:** "It's not likely you'll be able to sell them an idea alone if you are unproven. The key is showing them a fin-

ished product. But it is very important to get the company to sign a non-disclosure agreement to protect both you and their interests. If the product is good, it will get to market — I have no doubts about that."

**Edward Fletcher:** "I think the best strategy for success in the gaming industry is to try to publish and market your own product. At least that's what we tried to do with *Gridiron!* If you enter the industry planning on a distributor paying for your development, you are going to lose out in the long run. Even if he can sell ten times the number of games you can independently, you still won't make any more money than you would going it alone. You must be prepared to sell the product on your own. Keep your overhead low, and know what is the minimum number of units you must sell to break even. Then if you have a good product, the distributor will come to you rather than you going after him. You'll get a better deal and be better off in the long run if you can do it that way. That's what we've done, and as a result we have been pursued by some of the larger companies." (NOTE: Just after this interview and months after *Gridiron!*'s successful release, Fletcher and Bethesda Softworks signed an agreement with Electronic Arts to distribute the game.)

**Bob Lentini:** "I was naive when I went about selling my first product and I didn't get the best deal. But it did open up some doors. The general procedure that I was told was that you send a copy of your product to these companies and you try to get them to sign a non-disclosure form and take a look at it and see if they are interested or not. Instead, I would try to demonstrate the product in person if I could, without physically handing it over to them. Or maybe write them a letter to see if they are interested in the type of product I am developing. If they are interested, be sure to get the non-disclosure signed before turning it over so your work can't easily be stolen. At best, this is a bad situation for the programmer. The companies have the upper hand. Most will offer a non-disclosure, but in turn they expect you to sign a form saying you won't show the product to another company for 90 days. This is their decision-making period. Now for the programmer this is a nightmare because he's got a hot product ready to go and in order just to show it to someone, he's got to say he won't show it to anyone else. Then if the three months go by and the company isn't interested you've lost valuable marketing time. Who knows how many other products have entered the market while you were waiting so you could offer it to another company? I think that's an ugly method and I won't follow it again, simply because I've reached a point where I have some sort of name and hopefully I can get more respect than that. But the first time out I was against that wall.

> "The tough part in the beginning was not getting paid — that's a real disadvantage."

"I live in Las Vegas, and the Consumer Electronics Show is held here once a year. So I made appointments with the heads of the software companies exhibiting there and demonstrated my product on the spot. I was able to get immediate feedback. But I still got tied up in the system, and there was a delay in getting my product to the market. I did not get the best deal I could have gotten, but I was starving at the time, I was in debt up to my ears, I had absolutely no income. I learned a lot, but I definitely would not want to go through that ordeal again."

***Can you describe a typical financial arrangement between a programmer and the distributor?***

**Brian Fargo:** "We work on a royalty arrangement. We sell them an idea, they advance us royalties to begin production and when it is finished we receive a percentage of every sell. We are the manufacturer of software and they are the distributors. By the time they copy and begin marketing our products, we are already working on the next project."

**Edward Fletcher:** (NOTE: At the time of this interview the financial arrangement between *Bethesda Softworks* and *Electronic Arts* had not been finalized.)

**Bob Lentini:** "Well I can only speak for my deal. But it appears the general proceedings are that they will offer you a few thousand dollars front money as advanced royalties. The average royalty payment today appears to be somewhere between seven and 11 percent of the net sales, which isn't that good. For instance, if a program like *BobsTerm Pro* markets for $79.95 they might sell that to a distributor at about $40. Your percentage is based on the wholesale price not the retail. It's not big money. I think the split should be more even."

***You all have had successful, acclaimed titles; what do you see yourself doing ten years from now?***

**Brian Fargo:** "I hope I'll be doing the same thing only on a grander scale. With the CD-I (Compact Disk Interactive) technology coming along I think it is going to be really exciting when we have computer graphics as good as what you see in the movies along with real actors and true sound track and animation. That is really exciting to me. So I'm hoping entertainment will continue to be as popular as it is so the market just keeps going and more and more people get involved. This is what I want to do. I love this business."

**Edward Fletcher:** "I plan to stay in the entertainment industry as long as possible. I'd like to do some simulation if there were commercial applications. I enjoy doing just what I'm doing and I don't want to quit. I think the keyboard will become less important and other types of input more important in the future — like voice recognition software. People will be able to relate to computers better in the future because computers will begin behaving more like humans. The sights and sounds coming out of computers are going to be more pleasing and sophisticated, and people will begin to appreciate them for their artistic value. That's why I think this industry will always be a growth industry and I plan on being a part of it."

**Bob Lentini:** "I can't begin to answer that. If anyone had asked me four years ago what I would be doing today, it sure would not have been programming for a living. My past has been filled with changes. My career has jumped from one extreme to another. I can't speculate on what I'll be doing even a year from now. I may try to mix computers with my former interest — audio."

After listening to each man's story it became apparent that the difference between success and failure was neither luck or fate but timing and dedication. Although all three entered professional programming with a different background, their love for computers propelled them to the same professional level. And perhaps the most surprising truth to surface is that all learned the bulk of their programming skills, not in school, but with hands-on experience with a personal computer. For them, the time spent with their nose pressed against the monitor's screen and the hours of sleep lost exploring their computer's memory has finally paid off with big dividends.

## Dvorak Keyboard Software

*Continued from pg. 38*

> People who use the Dvorak keyboard type an average of 30% faster, make fewer errors, and suffer less fatigue.

Qwerty at the flip of a switch. This switch is installed in a case on the back of your Commodore. The complete Prelco kit includes key overlays, a modified ROM kernal, a switch and an illustrated instruction manual for installing the switch. Prelco will install the kernal at the factory, or you can have it installed by an electronic technician. The installation voids your remaining Commodore warranty. Prelco is licensed by Commodore to supply the ROM kernal. *DV Switcher* works only with the 64, but it uses any program that Commodore runs, including *Speedscript, Paper Clip, Multiplan, Superbase* and thousands of other programs.

Some people have expressed difficulty attaching the key overlays provided by Prelco with *DV Typer* and *DV Switcher*. The overlays are not pre-cut, so it takes patience to cut and stick them on the keys.

*DV Typer* sells for $36.95. *DV Switcher* sells for $39.95. Option extras for *DV Switcher* include: basic start-up message, background or text colors option, add $10.00; factory kernal installation, add $25.00. The price for both *DV Typer* and *DV Switcher* is $64.95. You may contact Prelco at 14292 Galy St., Tustin, CA 92680. Phone (714) 544-3041.

For more information about Dvorak, you may contact: Virginia Russell, a consultant for the Dvorak keyboard and president of Dvorak International, Box 128, Brandon, VT 05733. Phone (802) 247-6020. A quarterly newsletter, "Dvorak Developments" is available from Freelance Communications, Box 1895, Upland, CA 91785. The newsletter costs $12 per year. Editor Randy Cassingham has authored the book, *The Dvorak Keyboard* ($12.95).

Hooleon Company sells durable, precut, easy-to-apply key overlays for $26.95. Each sticker shows the Dvorak letter in large red, and the Qwerty letter in small black print. This allows you to use either Dvorak or Qwerty. Contact Hooleon Co., Box 201, Cornville, AZ 86325. C

## Software Reviews/Up Periscope!

*Continued from pg. 30*

With *Up Periscope!*, ActionSoft delivers a simulation that stands up to any on the market. Easy to approach, challenging to play and authentic in design, this program is a state of the art, sure-fire hit.

### Sub Standards

#### Avoiding That Sinking Feeling

The pair of books included with this package covers every possible aspect concerning the ups and downs of submarine life. After giving these gems the initial pre-game cover-to-cover treatment, Commodore Captains would be well advised to keep them close at hand during each and every sub patrol. When the torpedoes are missing and the enemy is closing in, it's comforting to know that experienced help is right at your side. To reiterate and expound upon what I've found to be the more important rules of the sea, I've listed a few sailing tips below:

- Whenever possible, it's a good idea to keep your sub positioned between the enemy convoy and a friendly port. If your ship becomes damaged or runs low on fuel, you want to be able to retreat for assistance without having to maneuver through a fleet of enemy ships bent on keeping you detained.
- When using the "Big Chart" navigation feature, *never* move yourself into a region where you will immediately encounter enemy ships. The final placement of your sub is too vague, and you might wind up sinking your own ship by blindly dropping yourself into an uncompromising position.
- When an enemy ship has your sub lined up on a ramming course, one of your instinctive commander reactions will be to dive. But as strange as it may seem, if the enemy is too close to be avoided, it is usually better to take the blow while you're still surfaced than to catch it during a dive. If your ship is hit after it has dipped below water level it has no reserve buoyancy, and there will be little if any chance for survival.
- Don't get caught in between. One of the more common and fatal errors of an inexperienced commander is to sail just below periscope depth. With the scope underwater and the radar inoperable, one can never be sure what danger is approaching. And since the sub is just below the surface, it's still shallow enough to be rammed and destroyed by a single blow from an undetected ship. If you're dropping below periscope depth, dive at least ninety feet. C

*Continued from pg. 98*

```
  SOUND RESUME
ThirdMeasure:

  SOUND WAIT

' Voice 0 (Harmony)
  SOUND A(5),W/4,80,0
  SOUND A(5),W/8,80,0
  SOUND A(5),W/8+W/8,80,0
  SOUND CS(5),W/4+W/8,80,0
' Voice 1 (Lead)
  SOUND B(4),W/8,100,1
  SOUND CS(5),W/8,100,1
  SOUND E(5),W/8,100,1
  SOUND E(5),W/8+W/8,100,1
  SOUND E(4),W/4+W/8,100,1
' Voice 2 (Bass line)
  SOUND A(2),W/2,90,2
  SOUND A(3),W/4,90,2
  SOUND E(3),W/8,90,2
  SOUND A(3),W/8,90,2
' Voice 3 (Harmony)
  SOUND E(5),W/4,80,3
  SOUND E(5),W/8,80,3
  SOUND E(5),W/8+W/8,80,3
  SOUND B(4),W/4+W/8,80,3

  SOUND RESUME

FourthMeasure:

  SOUND WAIT

' Voice 0
' NOT THIS MEASURE!
' Voice 1
  SOUND D(5),W,100,1
' Voice 2
  SOUND FS(4),W,80,2
' Voice 3
  SOUND D(3),W,80,3

  SOUND RESUME
END SUB

' With the StarTrek entry, I have limited playback to a single
' channel to demonstrate the manner in which BASIC queues the
' entries and then plays them in the order in which they come
' in.  You will note that the message at the end of the SOUND
' statements appears long before the music finishes.

SUB StarTrek STATIC
SHARED C(),CS(),D(),DS(),E(),F(),FS()
SHARED G(),GS(),A(),BF(),B(),Rp&
  W = 50
  SOUND C(4),W/8+W/32
  SOUND C(4),W/32,0
  SOUND F(4),W/16
  SOUND BF(4),W/4+W/8
  SOUND A(4),W/8
  SOUND F(4),W/10.33333
  SOUND D(4),W/10.33333
  SOUND G(4),W/10.33333
  SOUND C(5),W/4
  SOUND C(5),W/64,0
  SOUND C(5),W/16-W/64

  SOUND E(5),W/2

  Move& Rp&,100,178
  Text& Rp&,SADD("The Music is STILL Playing!"),27
  Curr& = TIMER
  WHILE TIMER < Curr& + 5 : WEND
  Move& Rp&,100,178
  Text& Rp&,SADD("                           "),27

' wait 5 seconds - this will work if interpreted or
' compiled, while a FOR - NEXT loop wouldn't!

END SUB

' Now, you can sit down and use the Waveforms and note
' definitions that we have developed and create your own
' tunes.  To enter the SOUND statements, you could simplify
' the durations with the following (I wanted to show what I
' was doing with each entry):

'     W = 60 (or whatever your whole note is)
'     H = W/2
'     Q = W/4
'     QT = W/4.66667
'     E = W/8
'     ET = W/10.33333
'     S = W/16
'     TH = W/32
'     etc.

' Then, you just enter the note array name (according to the
' octave - middle C is C(4)), the duration according to the
' chart above, the volume and the channel number.  Now you can
' enter music from sheet music by duplicating each voice from
' measure to measure (which is what I did with "After the
' Glitter.")
```

END

## Software Reviews/Gunship

*Continued from pg. 22*

and indicators are there for a purpose. Learn the value of each instrument and use that information throughout the simulation. Watch the panel above the windshield to see which systems are functional and which are not. A yellow light actually means that the system in question is damaged, not knocked out. You can continue to use this particular component, but be aware of the fact that it might not work properly or shoot directly at a target.

> Once you experience some of these scenarios, you really begin to think like a pilot and not like another arcade game player.

Smart pilots never fly very long in a straight line and their altitude is consistently 100 feet above the ground or lower. They also watch the back side of hills for enemy installations and use their radar and infra-red jammers sparingly. These measures give the enemy little advanced warning of your presence in an area, which may possibly prolong your life in the game. It also pays to know your password and countersign before each mission, so friendly forces won't fire on you as you complete a successful assignment.

**4. Using Weapons in The Field** — Folding Fin Aerial Rockets are great for knocking out infantry targets and can even destroy some "Hind" Attack Helicopters at close range. Use Sidewinder missiles strictly against Hind Helicopters. Hell-fire missiles were designed to knock out heavy equipment like tanks, bunkers, etc., but on occasion, I've used one to destroy a Hind helicopter as well. The 30mm Chain Gun does a nice job of taking out an infantry position, but it can sometimes be used to wipe out a bunker or Hind helicopter at close range.

**5. Hind Attack helicopters** — I try to get rid of Hind helicopters whenever one of them is operating in my area. They are fast, armor-plated, and carry a variety of weapons. If one of them gets behind you, evade it momentarily by banking your copter to one side or the other, and try to destroy the craft whenever you get an opportunity. Never evade an enemy helicopter for a long time. Your persistent foe will continue to track you and fire on your position while you are trying to destroy enemy targets on the ground. C

## Legacy of the Ancients

*Continued from pg. 26*

assigned a number of hit points that are lost in battle depending on your level. These hit points are your most important asset and can't be bought, only increased when moving up to another level. Your character will develop skills throughout the game, with opportunities to increase Endurance and Dexterity in the Training Schools in the towns, as well as a chance to increase Intelligence by playing the Stones of Wisdom game in the Galactic Museum.

Any good fantasy game includes magic as one of the character's choices in combat and other sticky situations. *Legacy of the Ancients* offers six spells at your disposal: Magic Flame, Firebolt, Befuddle Spell, Psycho Strength, Kill Flash and Seek Spell. All of the spells have their places to be used in the game and should be used whenever fighting is not going too well. There are 32 kinds of monsters in the wilderness and 12 kinds in the dungeons. Most are dangerous, with a few nasties that will kill you instantly if not well-protected. At the start of the game, especially watch out for the Ocean Sprayfish, Sea Swallows, Desert Scrabblers and Mountain Rock Beetles.

If the towns and wilderness aren't enough, you still have the dungeons, the castle and a fortress to explore. The castle and fortress are the most important places to examine, with the final parts of the game taking place in the castle. Don't enter the castle unless you're well-prepared for battle, very strong and very intelligent. The dungeons house all kinds of puzzles, magic items and challenges to your bravery. Don't be afraid to leave the dungeon if things get too hairy. A good rest in the nearest town will provide you with enough energy to return to the dungeon to gather more gold and treasures.

Not only do you have the adventure to deal with in *Legacy*, but the designers also included five action games as part of your quest. These games test *your* physical abilities and mental concentration as opposed to your character's and, although they have simple rules, are a unique and welcome addition to the already excellent adventure.

*Legacy of the Ancients* lives up to the advance interest it has raised and really gives your money's worth in entertainment for the adventure player. Take your time with the game and don't be discouraged if things are going a little slow at first. The pace will pick up as the Wizard's Compendium starts exhibiting its power and you gain higher levels. C

*Continued from pg. 44*

scores, they will use the occasion to pump themselves up, so that the rush of adrenaline may serve to spark another offensive flurry. And on the flip side, if you have a goaltender who is repeatedly pummeled with shots until he finally lets in the inevitable goal, he will immediately become despondent, and his intensity will wane noticeably.

Organized screen menus listing a full assortment of game options let every player easily outfit the contest to his liking. And whenever an official league game is played, the computer will be more than accommodating by updating the overall records and team stats.

From the board room to the end boards, this program recreates every facet of hockey, generating wide appeal by letting the user concentrate on those aspects of the game that he enjoys the most. For the player, the coach, the fan and the curious, the puck stops here.

## Skate Keys
### Icebreakers for Novice Players

The best way to get to know your squad's playing habits is to log some quality ice time alongside them. After a few hard-fought periods as center or goalie, you're sure to become familiar enough with your teammates' rink personalities to begin to mesh them together as a single unit. To help orient users to league conditions, Mindscape has included a lengthy list of strategic tips in their reference booklet. Look them over before you take your first shift. Below, I've also compiled a few additional hints of my own.

• Learning when and how to stop the on-ice action is one of the more important skills of a winning club. There will come times when your squad is tired, outmanned or confused, and in dire need of a breather. If one of your controlled players can get a stick on the puck, you should be able to use him to obtain an unofficial time out. If you're directing your goaltender, it's as simple as holding onto the puck long enough to get a whistle. If you're controlling your center, either cause an intentional offsides or lift a shot up over the boards and into the seats. Both of these moves will cause a play stoppage, allowing your team time to regroup.

• If you're using an attacking offensive strategy and it works well enough to put you in the lead, stick with it. Too many times, after effectively dominating their opponent with an aggressive play posture, teams will try to switch over to a straight defensive style in an attempt to protect the one or two goal advantage they've gained. To reemphasize a wise old hockey adage, "The best defense is a good offense." The other team can't possibly score if the puck is constantly hemmed in their end.

• Your goaltender is your last line of defense. Any error he makes will be a glaring one, for it will usually result in a goal. For this reason, if you're a newcomer to the game and want to control a player, it's probably better to direct the team's center until you become more comfortable with your surroundings. Any mistakes you make on the front line have a good chance of being erased by your defensive teammates.

• In hockey, the most critical point of a goal-scoring sequence can usually be traced to an event away from the puck, where a good block, check or decoy by one player springs the shooter for a quality chance on net. When playing center, remember that you can still take on an active contributory goal-scoring role without ever having touched the puck. ■

*Continued from pg. 108*

```
260 L1$=L1$+A$:IF A$=R$THEN RF=1'GQSJ
270 GOTO 220'BDDE
280 L2$=""'BDIF
290 GET#5,A$:IF ST>0 THEN E5=1
    :GOSUB 430:GOTO 350'HUWN
300 IF A$=""THEN RF=0:GOTO 350'FJEC
310 IF A$=" "OR A$=":"THEN 290'FHGD
320 IF RF THEN 290'CFAB
330 L2$=L2$+A$:IF A$=R$THEN RF=1'GQUH
340 GOTO 290'BDKC
350 IF L1$<>L2$THEN GOSUB 660
    :PRINT N2;"[SHFT C]HANGED"
    :GOSUB 680:C=C+1'JVDO
360 GOSUB 420'BDJE
370 GET B$:IF B$=""THEN 210'EIEI
380 IF B$="Q"THEN 700'DFAI
390 GET A$:IF A$=""THEN 390'EILK
400 GOTO 210'BDCY
410 REM------------------------------
    ---'BIQF
420 GOSUB 470:GOSUB 500
    :IF E2=1 AND E5=1 THEN 700'HRLH
430 IF N1<N2 THEN GOSUB 540
    :GOTO 430'FLYG
440 IF N2<N1 THEN GOSUB 600
    :GOTO 430'FLVH
450 RETURN'BAQD
460 REM------------------------------
    ---'BIQK
470 GET#2,A$,B$,L$,H$:N1=ASC(L$+CHR$
    (0))+(ASC(H$+CHR$(0))*256)'KLIS
480 IF(A$=""AND B$="")OR ST>0 THEN
    N1=63999'IQVO
490 RETURN'BAQH
500 GET#5,A$,B$,L$,H$:N2=ASC(L$+CHR$
    (0))+(ASC(H$+CHR$(0))*256)'KLMM
510 IF(A$=""AND B$="")OR ST>0 THEN
    N2=63999'IQWI
520 RETURN'BAQB
530 REM------------------------------
    ---'BIQI
540 GOSUB 660:PRINT N1;"[SHFT D]
    ELETED":GOSUB 680:C=C+1'FPEL
550 GET#2,A$:IF ST>0 THEN 580'EMYJ
560 IF A$=""THEN GOSUB 470:RETURN'FGGJ
570 GOTO 550'BDJH
580 IF E2 THEN END'DCPJ
590 N1=63999:RETURN'CINL
600 GOSUB 660:PRINT N2;"[SHFT I]
    NSERTED":GOSUB 680:C=C+1'FPDJ
610 GET#5,A$:IF ST>0 THEN 640'EMYG
620 IF A$=""THEN GOSUB 500:RETURN'FGAG
630 GOTO 610'BDGE
640 IF E5 THEN END'DCSG
650 N2=63999:RETURN'CIOI
660 IF V$="P"THEN OPEN 4,4,7
    :CMD 4'FJEL
670 RETURN'BAQH
680 IF V$="P"THEN PRINT#4:CLOSE 4'FFLM
690 RETURN'BAQJ
700 PRINT:PRINT F2$;" HAD";C;
    "MODIFICATIONS.":CLOSE 5:CLOSE 2
    :CLOSE 1:END'GPIM
```

END

Continued from pg. 54

```
    201,13,208,8,192,2100'BYTH
230 DATA 0,240,227,208,91,240,129,201,
    20,208,11,32,1607'BVCI
240 DATA 210,255,136,16,250,200,132,
    212,240,166,196,2,2015'BYCJ
250 DATA 176,204,166,2,224,1,240,30,
    201,48,144,194,1630'BVMK
260 DATA 224,16,208,6,201,50,144,18,
    176,184,201,58,1486'BVFL
270 DATA 144,12,224,5,240,176,201,65,
    144,172,201,71,1655'BWPM
280 DATA 176,168,32,210,255,224,1,240,
    18,224,5,240,1793'BVXN
290 DATA 14,201,65,176,4,56,233,48,44,
    233,55,164,1293'BTLO
300 DATA 252,198,252,153,0,2,230,253,
    208,129,240,165,2082'BXVG
310 DATA 166,2,224,1,208,11,173,0,2,
    133,20,169,1109'BRKG
320 DATA 0,133,21,240,85,224,5,208,29,
    169,0,162,1276'BSCH
330 DATA 2,133,122,134,123,32,138,173,
    165,97,201,145,1465'BXUJ
340 DATA 176,3,184,80,58,169,63,32,
    210,255,169,0,1399'BTZK
350 DATA 240,204,232,134,251,162,1,
    134,252,198,251,240,2299'BANM
360 DATA 29,230,252,166,251,189,0,2,
    32,126,189,166,1632'BVJM
370 DATA 253,224,2,144,22,169,139,160,
    0,32,40,186,1371'BUSN
380 DATA 166,252,228,253,144,223,166,
    251,202,189,0,2,2076'BXCO
390 DATA 32,126,189,32,247,183,169,32,
    32,210,255,162,1669'BXQP
400 DATA 35,208,11,165,21,166,20,32,
    205,189,169,0,1221'BUPH
410 DATA 162,36,72,169,13,32,210,255,
    138,32,210,255,1584'BWBI
420 DATA 104,133,251,224,35,240,228,
    224,37,240,78,133,1927'BYYJ
430 DATA 252,165,21,208,4,230,252,165,
    20,162,0,134,1613'BVFK
440 DATA 254,201,16,176,12,72,169,48,
    32,210,255,104,1549'BWDL
450 DATA 184,80,23,240,131,230,254,56,
    233,16,201,16,1664'BWPM
460 DATA 176,247,72,198,251,208,5,104,
    230,251,240,2,1984'BWJN
470 DATA 165,254,201,10,144,4,24,105,
    55,44,105,48,1159'BURO
480 DATA 32,210,255,165,251,208,232,
    165,252,240,190,165,2365'BBRQ
490 DATA 20,162,37,208,157,160,0,165,
    21,240,16,133,1319'BVLQ
500 DATA 252,169,18,32,210,255,200,
    208,6,169,146,32,1697'BWLI
510 DATA 210,255,136,169,128,133,2,
    185,251,0,37,2,1508'BUWJ
520 DATA 197,2,176,3,169,48,44,169,49,
    32,210,255,1354'BTZK
530 DATA 70,2,208,235,192,0,240,155,
    208,219,72,65,1666'BUHL
```

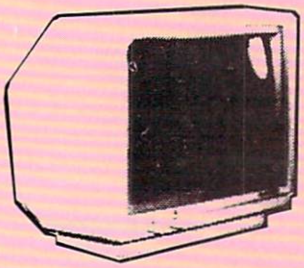
END

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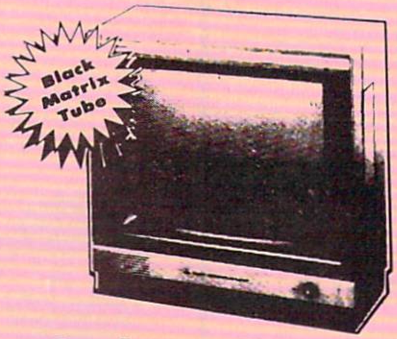
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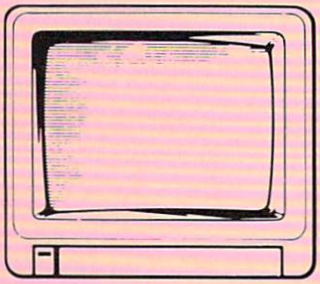
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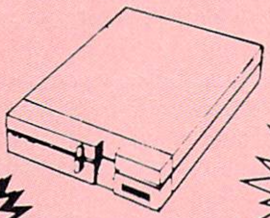
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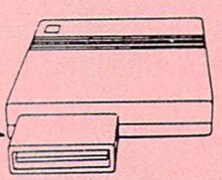
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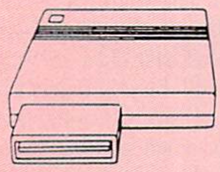
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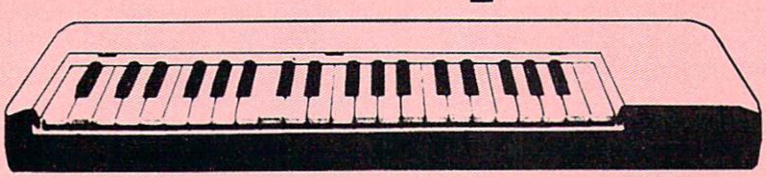
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**Teaches** — Scales • Bass lines • Popular songs "Bolero" to "Thriller".

**Features** — Control with attack, delay, sustain and release times • Playback tracks while you record • Stores songs on disk • Much more

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## HOW TO ENTER PROGRAMS

The programs which appear in this magazine have been run, tested and checked for bugs and errors. After a program is tested, it is printed on a letter quality printer with some formatting changes. This listing is then photographed directly and printed in the magazine. Using this method ensures the most error-free program listings possible.

Whenever you see a word inside brackets, such as [DOWN], the word represents a keystroke or series of keystrokes on the keyboard. The word [DOWN] would be entered by pressing the cursor-down key. If multiple keystrokes are required, the number will directly follow the word. For example, [DOWN4] would mean to press the cursor-down key four times. If there are multiple words within one set of brackets, enter the keystrokes directly after one another. For example, [DOWN, RIGHT2] would mean to press the cursor-down key once and then the cursor-right key twice. Note: Do not enter the commas.

In addition to these graphic symbols, the keyboard graphics are all represented by a word and a letter. The word is either SHFT or CMD and represents the SHIFT key or the Commodore key. The letter is one of the letters on the keyboard. The combination [SHFT E] would be entered by holding down the SHIFT key and pressing the E. A number following the letter tells you how many times to type the letter. For example, [SHFT A4,CMD B3] would mean to hold the SHIFT key and press the A four times, then hold down the Commodore key and press the B three times.

The following chart tells you the keys to press for any word or words inside of brackets. Refer to this chart whenever you aren't sure what keys to press. The little graphic next to the keystrokes shows you what you will see on the screen.

"[HOME]" = UNSHIFTED CLR/ HOME
"[CLEAR]" = SHIFTED CLR/HOME
"[DOWN]" = CURSOR DOWN
"[UP]" = CURSOR UP
"[RIGHT]" = CURSOR RIGHT
"[LEFT]" = CURSOR LEFT
"[RVS]" = CONTROL 9
"[RVOFF]" = CONTROL 0
"[BLACK]" = CONTROL 1
"[WHITE]" = CONTROL 2
"[RED]" = CONTROL 3
"[CYAN]" = CONTROL 4
"[PURPLE]" = CONTROL 5
"[GREEN]" = CONTROL 6
"[BLUE]" = CONTROL 7
"[YELLOW]" = CONTROL 8
"[ORANGE]" = COMMODORE 1
"[BROWN]" = COMMODORE 2
"[L. RED]" = COMMODORE 3
"[GRAY1]" = COMMODORE 4
"[GRAY2]" = COMMODORE 5
"[L. GREEN]" = COMMODORE 6
"[L. BLUE]" = COMMODORE 7
"[GRAY3]" = COMMODORE 8
"[F1]" = F1
"[F2]" = F2
"[F3]" = F3
"[F4]" = F4
"[F5]" = F5
"[F6]" = F6
"[F7]" = F7
"[F8]" = F8
"[POUND]" = ENGLISH POUND
"[SHFT ^]" = PI SYMBOL
"[^]" = UP ARROW

GRAPHIC SYMBOLS WILL BE REPRESENTED AS EITHER THE LETTERS SHFT (SHIFT) AND A KEY ("[SHFT Q,SHFT J,SHFT D,SHFT S]") OR THE LETTERS CMDR (COMMODORE) AND A KEY ("[CMDR Q,CMDR G,COMDR Y,CMDR H]"). IF A SYMBOL IS REPEATED, THE NUMBER OF REPITITIONS WILL BE DIRECTLY AFTER THE KEY AND BEFORE THE COMMA ("[SPACE3,SHFT S4,CMDR M2]").

### SYNTAX ERROR

This is by far the most common error encountered while entering a program. Usually (sorry folks) this means that you have typed something incorrectly on the line the syntax error refers to. If you get the message "?Syntax Error Break In Line 270", type LIST 270 and press RETURN. This will list line 270 to the screen. Look for any non-obvious mistakes like a zero in place of an O or vice-versa. Check for semicolons and colons reversed and extra or missing parenthesis. All of these things will cause a syntax error.

There is only one time a syntax error will tell you the "wrong" line to look at. If the line the syntax error refers to has a function call (i.e., FN A(3)), the syntax error may be in the line that defines the function, rather than the line named in the error message. Look for a line near the beginning of the program (usually) that has DEF FN A(X) in it with an equation following it. Look for a typo in the equation part of this definition.

### ILLEGAL QUANTITY ERROR

This is another common error message. This can also be caused by a typing error, but it is a little harder to find. Once again, list the line number that the error message refers to. There is probably a poke statement on this line. If there is, then the error is referring to what is trying to be poked. A number must be in the range of zero to 255 to be poke-able. For example, the statement POKE 1024,260 would produce an illegal quantity error because 260 is greater than 255.

Most often, the value being poked is a variable (A,X...). This error is telling you that this variable is out of range. If the variable is being read from data statements, then the problem is somewhere in the data statements. Check the data statements for missing commas or other typos.

If the variable is not coming from data statements, then the problem will be a little harder to find. Check each line that contains the variable for typing mistakes.

### OUT OF DATA ERROR

This error message is always related to the data statements in a program. If this error occurs, it means that the program has run out of data items before it was supposed to. It is usually caused by a problem or typo in the data statements. Check first to see if you have left out a whole line of data. Next, check for missing commas between numbers. Reading data from a page of a magazine can be a strain on the brain, so use a ruler or a piece of paper or anything else to help you keep track of where you are as you enter the data.

### OTHER PROBLEMS

It is important to remember that the 64 and the PET/CBM computers will only accept a line up to 80 characters long. The VIC 20 will accept a line up to 88 characters long. Sometimes you will find a line in a program that runs over this number of characters. This is not a mistake in the listing. Sometimes programmers get so carried away crunching programs that they use abbreviated commands to get more than 80 (or 88) characters on one line. You can enter these lines by abbreviating the commands when you enter the line. The abbreviations for BASIC commands are on pages 133-134 of the VIC 20 user guide and 130-131 of the Commodore 64 user's guide.

If you type a line that is longer than 80 (or 88) characters, the computer will act as if everything is ok, until you press RETURN. Then, a syntax error will be displayed (without a line number). Many people write that the computer gives them a syntax error when they type the line, or that the computer refuses to accept a line. Both of these problems are results of typing a line of more than 80 (or 88) characters.

## THE PROGRAM WON'T RUN!!

This is the hardest of problems to resolve; no error message is displayed, but the program just doesn't run. This can be caused by many small mistakes typing a program in. First check that the program was written for the computer you are using. Check to see if you have left out any lines of the program. Check each line of the program for typos or missing parts. Finally, press the RUN/STOP key while the program is "running". Write down the line the program broke at and try to follow the program backwards from this point, looking for problems.

## IF ALL ELSE FAILS

You've come to the end of your rope. You can't get the program to run and you can't find any errors in your typing. What do you do? As always, we suggest that you try a local user group for help. In a group of even just a dozen members, someone is bound to have typed in the same program. The user group may also have the program on a library disk and be willing to make a copy for you.

If you do get a working copy, be sure to compare it to your own version so that you can learn from your errors and increase you understanding of programming.

If you live in the country, don't have a local user group, or you simply can't get any help, write to us. If you do write to us, include the following information about the program you are having problems with:

The name of the program
The issue of the magazine it was in
The computer you are using
Any error messages and the line numbers
Anything displayed on the screen
A printout of your listing (if possible)

All of this information is helpful in answering your questions about why a program doesn't work. A letter that simply states "I get an error in line 250 whenever I run the program" doesn't give us much to go on. Send your questions to:

*Commodore Magazine*
1200 Wilson Drive
West Chester, PA 19380
ATTN: Program Problem

Have fun with the programs!

# HOW TO USE THE MAGAZINE ENTRY PROGRAMS

The Magazine Entry Programs on the next pages are two BASIC machine language programs that will assist you in entering the programs in this magazine correctly. There are versions for both the Commodore 64 and the Commodore 128. Once the program is in place, it works its magic without you having to do anything else. The program will not let you enter a line if there is a typing mistake on it, and better yet, it identifies the kind of error for you.

## Getting Started

Type in the Magazine Entry Program carefully and save it as you go along (just in case). Once the whole program is typed in, save it again on tape or disk. Now RUN the program. The word POKING will appear on the top of the screen with a number. The number will increment from 49152 up to 49900 (4864-5545 on the 128) and just lets you know that the program is running. If everything is ok, the program will finish running and say DONE. Then type NEW. If there is a problem with the data statements, the program will tell you where to find the problem. Otherwise the program will say "mistake in data statements." Check to see if commas are missing, or if you have used periods instead of commas. Also check the individual data items.

Once the program has run, it is in memory ready to go. To activate the program type SYS49152 (SYS4864 on the 128), and press RETURN. You are now ready to enter the programs from the magazine. To disable the Entry Program, just type KILL [RETURN] on the 64 or SYS4867 on the 128.

The checksums for each line are the same for both the 64 and 128, so you can enter your 64 programs on the 128 if you'd like.

## Typing the Programs

All the BASIC program listings in this magazine that are for the 64 or 128 have an apostrophe followed by four letters at the end of the line (e.g., 'ACDF). If you plan to use the Magazine Entry Program to enter your programs, the apostrophe and letters **should** be entered along with the rest of the line. This is a checksum that the Magazine Entry Program uses.

Enter the line and the letters at the end and then press RETURN, just as you normally would.

If the line is entered correctly, a bell is sounded and the line is entered into the computer's memory (without the characters at the end).

If a mistake was made while entering the line, a noise is sounded and an error message is displayed. Read the error message, then press any key to erase the message and correct the line.

## IMPORTANT

If the Magazine Entry Program sees a mistake on a line, it **does not** enter that line into memory. This makes it impossible to enter a line incorrectly.

## Error Messages and What They Mean

There are five error messages that the Magazine Entry Program uses. Here they are, along with what they mean and how to fix them.

**NO CHECKSUM:** This means that you forgot to enter the apostrophe and the four letters at the end of the line. Move the cursor to the end of the line you just typed and enter the checksum.

**QUOTE:** This means that you forgot (or added) a quote mark somewhere in the line. Check the line in the magazine and correct the quote.

**KEYWORD:** This means that you have either forgotten a command or spelled one of the BASIC keywords (GOTO, PRINT. . ) incorrectly. Check the line in the magazine again and check your spelling.

**# OF CHARACTERS:** This means that you have either entered extra characters or missed some characters. Check the line in the magazine again. This error message will also occur if you misspell a BASIC command, but create another keyword in doing so. For example, if you misspell PRINT as PRONT, the 64 sees the letter P and R, the BASIC keyword ON and then the letter T. Because it sees the keyword ON, it thinks you've got too many characters, instead of a simple misspelling. Check spelling of BASIC commands if you can't find anything else wrong.

**UNIDENTIFIED:** This means that you have either made a simple spelling error, you typed the wrong line number, or you typed the checksum incorrectly. Spelling errors could be the wrong number of spaces inside quotes, a variable spelled wrong, or a word misspelled. Check the line in the magazine again and correct the mistake.

```
10 PRINT"[CLEAR]POKING -";
20 P=49152 :REM $C000  (END AT
   49900/$C2EC)
30 READ A$:IF A$="END"THEN 110
40 L=ASC(MID$(A$,2,1))
50 H=ASC(MID$(A$,1,1))
60 L=L-48:IF L>9 THEN L=L-7
70 H=H-48:IF H>9 THEN H=H-7
80 PRINT"[HOME,RIGHT12]"P;
90 IF H>15 OR L>15 THEN PRINT
   :PRINT"DATA ERROR IN LINE";
   1000+INT((P-49152)/8):STOP
100 B=H*16+L:POKE P,B:T=T+B:P=P+1
   :GOTO 30
110 IF T<>86200 THEN PRINT
   :PRINT"MISTAKE IN DATA --> CHECK
   DATA STATEMENTS":END
120 PRINT"DONE":END
1000 DATA 4C,1F,C0,00,00,00,00,00
1001 DATA 00,00,00,00,00,0D,00,21
1002 DATA C1,27,C1,2F,C1,3F,C1,4C
1003 DATA C1,EA,EA,EA,4C,54,C0,A2
1004 DATA 05,BD,19,C0,95,73,CA,10
1005 DATA F8,60,60,A0,03,B9,00,02
1006 DATA D9,04,C1,D0,F5,88,10,F5
1007 DATA A0,05,B9,A2,E3,99,73,00
1008 DATA 88,10,F7,A9,00,8D,18,D4
1009 DATA 4C,EF,C0,E6,7A,D0,02,E6
1010 DATA 7B,4C,79,00,A5,9D,F0,F3
1011 DATA A5,7A,C9,FF,D0,ED,A5,7B
1012 DATA C9,01,D0,E7,20,2B,C0,AD
1013 DATA 00,02,20,74,C0,90,DC,A0
1014 DATA 00,4C,A9,C1,C9,30,30,06
1015 DATA C9,3A,10,02,38,60,18,60
1016 DATA C8,B1,7A,C9,20,D0,03,C8
1017 DATA D0,F7,B1,7A,60,18,C8,B1
1018 DATA 7A,F0,37,C9,22,F0,F5,6D
1019 DATA 03,C0,8D,03,C0,AD,04,C0
1020 DATA 69,00,8D,04,C0,4C,8E,C0
1021 DATA 18,6D,05,C0,8D,05,C0,90
1022 DATA 03,EE,06,C0,EE,09,C0,4C
1023 DATA CE,C1,18,6D,08,C0,8D,08
1024 DATA C0,90,03,EE,07,C0,EE,0A
1025 DATA C0,60,0A,A8,B9,0F,C0,85
1026 DATA FB,B9,10,C0,85,FC,A0,00
1027 DATA A9,12,20,D2,FF,B1,FB,F0
1028 DATA 06,20,D2,FF,C8,D0,F6,20
1029 DATA BC,C2,20,E4,FF,F0,FB,A0
1030 DATA 18,B9,08,C1,20,D2,FF,88
1031 DATA 10,F7,68,68,A9,00,8D,00
1032 DATA 02,4C,74,A4,4B,49,4C,4C
1033 DATA 91,91,0D,20,20,20,20,20
1034 DATA 20,20,20,20,20,20,20,20
1035 DATA 20,20,20,20,20,20,20,91
1036 DATA 0D,51,55,4F,54,45,00,4B
1037 DATA 45,59,57,4F,52,44,00,23
1038 DATA 20,4F,46,20,43,48,41,52
1039 DATA 41,43,54,45,52,53,00,55
1040 DATA 4E,49,44,45,4E,54,49,46
1041 DATA 49,45,44,00,4E,4F,20,43
1042 DATA 48,45,43,4B,53,55,4D,00
1043 DATA C8,B1,7A,D0,FB,84,FD,C0
1044 DATA 09,10,03,4C,84,C1,88,88
1045 DATA 88,88,88,B1,7A,C9,27,D0
1046 DATA 13,A9,00,91,7A,C8,A2,00
1047 DATA B1,7A,9D,3C,03,C8,E8,E0
1048 DATA 04,D0,F5,60,A9,04,4C,CA
1049 DATA C0,A0,00,B9,00,02,99,40
1050 DATA 03,F0,F0,C8,D0,F5,A0,00
1051 DATA B9,40,03,F0,E6,99,00,02
1052 DATA C8,D0,F5,20,96,C1,4C,12
1053 DATA C2,A0,09,A9,00,99,03,C0
1054 DATA 8D,3C,03,88,10,F7,A9,80
1055 DATA 85,02,A0,00,20,58,C1,20
1056 DATA 89,C1,20,ED,C1,E6,7A,E6
1057 DATA 7B,20,7C,A5,A0,00,20,80
1058 DATA C0,F0,D0,24,02,F0,06,4C
1059 DATA A8,C0,4C,CE,C1,C9,22,D0
1060 DATA 06,20,8D,C0,4C,CE,C1,20
1061 DATA BA,C0,4C,CE,C1,A0,00,B9
1062 DATA 00,02,20,74,C0,C8,90,0A
1063 DATA 18,6D,07,C0,8D,07,C0,4C
1064 DATA EF,C1,88,A2,00,B9,00,02
1065 DATA 9D,00,02,F0,04,E8,C8,D0
1066 DATA F4,60,18,AD,09,C0,69,41
1067 DATA 8D,09,C0,38,AD,0A,C0,E9
1068 DATA 19,90,06,8D,0A,C0,4C,1C
1069 DATA C2,AD,0A,C0,69,41,8D,0A
1070 DATA C0,AD,03,C0,6D,05,C0,48
1071 DATA AD,04,C0,6D,06,C0,8D,0C
1072 DATA C0,68,6D,08,C0,8D,0B,C0
1073 DATA AD,0C,C0,6D,07,C0,8D,0C
1074 DATA C0,38,E9,19,90,06,8D,0C
1075 DATA C0,4C,52,C2,AD,0C,C0,69
1076 DATA 41,8D,0C,C0,AD,0B,C0,E9
1077 DATA 19,90,06,8D,0B,C0,4C,67
1078 DATA C2,AD,0B,C0,69,41,8D,0B
1079 DATA C0,A0,01,AD,09,C0,CD,3C
1080 DATA 03,D0,20,C8,AD,0A,C0,CD
1081 DATA 3D,03,D0,17,C8,AD,0B,C0
1082 DATA CD,3E,03,D0,0E,AD,0C,C0
1083 DATA CD,3F,03,D0,06,20,CC,C2
1084 DATA 4C,4B,C0,98,48,68,4C,CA
1085 DATA C0,A9,20,8D,00,D4,8D,01
1086 DATA D4,A9,09,8D,05,D4,A9,0F
1087 DATA 8D,18,D4,60,20,A9,C2,A9
1088 DATA 81,20,DF,C2,A9,80,20,DF
1089 DATA C2,4C,D9,C2,20,A9,C2,A9
1090 DATA 11,20,DF,C2,A9,10,20,DF
1091 DATA C2,A9,00,8D,04,D4,60,8D
1092 DATA 04,D4,A2,70,A0,00,88,D0
1093 DATA FD,CA,D0,FA,60,END
```

END

```
5 TRAP 200
10 PRINT"[CLEAR]POKING -";
20 P=4864 :REM $1300  (END AT
   5545/$15A9)
30 READ A$:IF A$="END"THEN 110
80 PRINT"[HOME,RIGHT12]"P;
100 B=DEC(A$):POKE P,B:T=T+B:P=P+1
    :GOTO 30
110 IF T<>59382 THEN PRINT
    :PRINT"MISTAKE IN DATA --> CHECK
    DATA STATEMENTS":END
1000 DATA 4C,1E,13,4C,3A,13,00,00
1001 DATA 8E,00,F7,00,42,41,51,57
1002 DATA 0D,00,0D,43,08,14,0E,14
1003 DATA 16,14,26,14,33,14,A9,00
1004 DATA 8D,00,FF,AD,04,03,8D,12
1005 DATA 13,AD,05,03,8D,13,13,A2
1006 DATA 4A,A0,13,8E,04,03,8C,05
1007 DATA 03,60,AD,12,13,8D,04,03
1008 DATA AD,13,13,8D,05,03,60,6C
1009 DATA 12,13,A5,7F,D0,F9,AD,00
1010 DATA 02,20,5B,13,90,F1,A0,00
1011 DATA 4C,6F,14,C9,30,30,06,C9
1012 DATA 3A,10,02,38,60,18,60,C8
1013 DATA B1,3D,C9,20,D0,03,C8,D0
1014 DATA F7,B1,3D,60,18,C8,B1,3D
1015 DATA F0,35,C9,22,F0,F5,6D,06
1016 DATA 13,8D,06,13,AD,07,13,69
1017 DATA 00,8D,07,13,4C,75,13,18
1018 DATA 6D,08,13,8D,08,13,90,03
1019 DATA EE,09,13,EE,0C,13,60,18
1020 DATA 6D,0B,13,8D,0B,13,90,03
1021 DATA EE,0A,13,EE,0D,13,60,0A
1022 DATA A8,B9,14,13,85,FB,B9,15
1023 DATA 13,85,FC,A0,00,8C,00,FF
1024 DATA A9,12,20,D2,FF,B1,FB,F0
1025 DATA 06,20,D2,FF,C8,D0,F6,20
1026 DATA 79,15,20,A3,15,20,E4,FF
1027 DATA F0,FB,A0,1B,B9,EF,13,20
1028 DATA D2,FF,88,10,F7,68,68,A9
1029 DATA 00,8D,00,02,4C,B7,4D,91
1030 DATA 91,0D,20,20,20,20,20,20
1031 DATA 20,20,20,20,20,20,20,20
1032 DATA 20,20,20,20,20,20,91,0D
1033 DATA 51,55,4F,54,45,00,4B,45
1034 DATA 59,57,4F,52,44,00,23,20
1035 DATA 4F,46,20,43,48,41,52,41
1036 DATA 43,54,45,52,53,00,55,4E
1037 DATA 49,44,45,4E,54,49,46,49
1038 DATA 45,44,00,4E,4F,20,43,48
1039 DATA 45,43,4B,53,55,4D,00,C8
1040 DATA B1,3D,D0,FB,98,30,04,C9
1041 DATA 06,30,1E,88,88,88,88,88
1042 DATA B1,3D,C9,27,D0,13,A9,00
1043 DATA 91,3D,C8,A2,00,B1,3D,9D
1044 DATA 00,0B,C8,E8,E0,04,D0,F5
1045 DATA 60,4C,5C,15,4C,C5,14,A0
1046 DATA 09,A9,00,99,06,13,8D,00
1047 DATA 0B,88,10,F7,A9,80,85,FD
1048 DATA A0,00,20,3F,14,20,AE,14
1049 DATA 20,0D,43,84,FA,A0,FF,20
1050 DATA 67,13,F0,D8,24,FD,F0,06
1051 DATA 20,8F,13,4C,8F,14,C9,22
1052 DATA D0,06,20,74,13,4C,8F,14
1053 DATA 20,9F,13,4C,8F,14,A0,00
1054 DATA B9,00,02,20,5B,13,C8,90
1055 DATA 0A,18,6D,0A,13,8D,0A,13
1056 DATA 4C,B0,14,88,60,18,AD,0C
1057 DATA 13,69,41,8D,0C,13,38,AD
1058 DATA 0D,13,E9,19,90,06,8D,0D
1059 DATA 13,4C,CF,14,AD,0D,13,69
1060 DATA 41,8D,0D,13,AD,06,13,6D
1061 DATA 08,13,48,AD,07,13,6D,09
1062 DATA 13,8D,0F,13,68,6D,0B,13
1063 DATA 8D,0E,13,AD,0F,13,6D,0A
1064 DATA 13,8D,0F,13,38,E9,19,90
1065 DATA 06,8D,0F,13,4C,05,15,AD
1066 DATA 0F,13,69,41,8D,0F,13,AD
1067 DATA 0E,13,E9,19,90,06,8D,0E
1068 DATA 13,4C,1A,15,AD,0E,13,69
1069 DATA 41,8D,0E,13,A0,01,AD,0C
1070 DATA 13,CD,00,0B,D0,20,C8,AD
1071 DATA 0D,13,CD,01,0B,D0,17,C8
1072 DATA AD,0E,13,CD,02,0B,D0,0E
1073 DATA AD,0F,13,CD,03,0B,D0,06
1074 DATA 20,89,15,A4,FA,60,98,48
1075 DATA 68,4C,AF,13,A9,04,4C,AF
1076 DATA 13,A9,00,8D,00,FF,A9,20
1077 DATA 8D,00,D4,8D,01,D4,A9,09
1078 DATA 8D,05,D4,A9,0F,8D,18,D4
1079 DATA 60,20,61,15,A9,81,20,9C
1080 DATA 15,A9,80,20,9C,15,4C,96
1081 DATA 15,20,61,15,A9,11,20,9C
1082 DATA 15,A9,10,20,9C,15,A9,00
1083 DATA 8D,04,D4,60,8D,04,D4,A2
1084 DATA 70,A0,00,88,D0,FD,CA,D0
1085 DATA FA,60,END
```

END

## 128 Users Only/128 Mode

*Continued from pg. 64*

```
4140 RETURN'BAQB
4200 SLOW:PRINT"[HOME2,CLEAR,RVS,BLUE]
      [SHFT H] [BLACK]=[SHFT H]
     ITTERS' STATS[SPACE2,BLUE]
     [SHFT I] [BLACK]=[SHFT P]
     ITCHERS' STATS "'CCSO
4210 PRINT "[RVS,BLUE] [SHFT P]
     [BLACK]=[SHFT P]RINTER[SPACE9,
     BLUE] [SHFT X] [BLACK]=[SHFT E]
     XIT[SPACE12]"ET$'BDSL
4220 DO:GET KEY A$:IF A$="X"THEN
     EXIT'HGLG
4225 F=3:A=0:IF A$="P"THEN F=4
     :A=20'HOXN
4227 OPEN 4,F,7'BFRI
4230 IF A$="P"THEN GOSUB 4260:PRINT#4
     :GOSUB 4265:GOTO 4250'HSFJ
4235 PRINT"[CLEAR,DOWN3,RVS]";'BBWH
4240 IF A$="H"THEN GOSUB 4260'EGJF
4245 IF A$="I"THEN GOSUB 4265'EGPK
4250 CLOSE 4:LOOP'CCYE
4255 PRINT"[HOME2,CLEAR]":GRAPHIC GM
     :RETURN'DEXL
4260 PRINT#4,TAB(A)"-[SHFT P]LAYER
     [SPACE7,SHFT A,SHFT B,SPACE3,
     SHFT H,SPACE4,SHFT B2,SPACE3,
     SHFT H,SHFT R,SPACE4,SHFT A]VE
     [SPACE2]":FOR T=1 TO B
     :PRINT#4,TAB(A)BS$(0,T);
     :PRINT#4,USING".###";EB(T):NEXT
     :RETURN'LISF
4265 PRINT#4,TAB(A)"-[SHFT P]LAYER
     [SPACE7,SHFT I,SHFT P,SPACE3,
     SHFT H,SPACE4,SHFT S,SHFT O,
     SPACE3,SHFT B2,SPACE4,SHFT E,
     SHFT R,SHFT A,SPACE2]"
     :FOR T=C TO 1 STEP-1
     :PRINT#4,TAB(A)BS$(1,T);
     :PRINT#4,USING"#.##";EA(T):NEXT
     :RETURN'NJWN
```

END

### File Converter

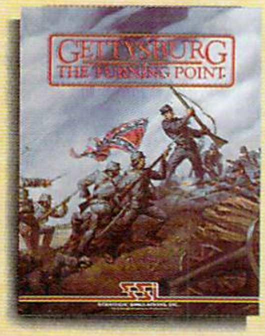
```
10 E$=CHR$(27):DIM X$(500)'DOOB
20 PRINT"[CLEAR]":DIRECTORY"BB.*"'CBCB
30 PRINT"[HOME,DOWN]":A$="BB."'CDTB
40 DO UNTIL LEFT$(A$,3)<>"BB."
   :PRINT E$"K[LEFT3,SPACE3]"E$"J";
   'GMQK
50 POKE 208,1:POKE 842,13'CMPE
60 INPUT A$:GOSUB 100'CGPE
70 LOOP'BAKD
80 PRINT"[CLEAR,BELL,SHFT D]ONE!"'BAEG
90 END'BACF
100 DOPEN#2,(A$):C=0'CLKX
110 DO:C=C+1:INPUT#2,X$(C)'EMYB
120 LOOP UNTIL X$(C)="EOF"'DFJB
130 DCLOSE'BBNY
140 SCRATCH(A$):DOPEN#2,(A$),W'CPQD
150 FOR T=1 TO C STEP 7:PRINT#2,X$(T)
    :PRINT#2,X$(T+1)'HVBI
160 FOR I=2 TO 6:PRINT#2,X$(T+I)
    :PRINT#2,STR$(0):NEXT:NEXT'JUJK
170 DCLOSE:RETURN'CCMD
```

END

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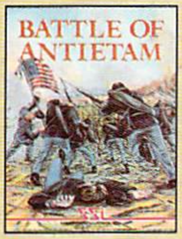
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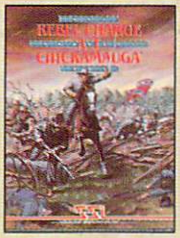
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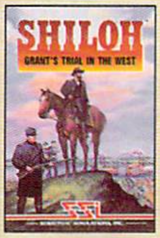

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